U.S. INFORMATION SERVICES
MARKET ANALYSIS PROGRAM

Banking & Finance

Information Services Opportunities & Trends

1992-1997

INPUT®

1280 Villa Street, Mountain View, CA 94041, (415) 961-3300

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BANKING & FINANCE

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Purpose and Methodology

1. Purpose

There are five basic objectives of this Market Analysis Program vertical market report:

1. Industry Introduction - Introduce the reader to the banking and finance industry's structure and demographics.

2. Business Issues and Trends - Identify the business issues and trends that are driving the use of information services within the banking and finance industry.

3. Systems Uses and Issues - Discuss how the banking and finance industry uses information systems, and the issues facing banking and finance industry information systems organizations.

4. Information Services Market - Discuss the information services market within the banking and finance industry, including market sizing and factors driving market demand for each delivery mode.

5. Competitive Environment and Vendors - Discuss the competitive environment and profile leading information services vendors in the banking and finance industry.

2. Methodology

Much of the data on which this report is based were gathered during 1991 and early 1992 as part of INPUT's ongoing market analysis program. Trends, market sizes, and growth rates are based upon INPUT research and in-depth interviews with users in the banking and finance industry and the IS vendors serving the industry. INPUT maintains ongoing relationships with, and a data base of, all users and vendors that it interviews. Interviewees for the research portion of this report were selected from this data base of contacts.

In addition, extensive use was made of INPUT's corporate library located in Mountain View, California. The resources in this library include on-line periodical data bases, subscriptions to a broad range of computer and general business periodicals, continually updated files on over 3,000 information services vendors, and the most up-to-date U.S. Department of Commerce publications on industry statistics.

It must be noted that vendors may be unwilling to provide detailed revenue breakouts by delivery mode or industry. Also, vendors often use different categories of industries and industry segments, or view their services as falling into different delivery modes from those used by INPUT. Thus, INPUT must estimate revenues for these categories on a best-effort basis. For this reason, the delivery mode and individual segment forecasts should be viewed as indicators of general patterns and trends rather than specific, detailed estimates for individual years.

When information is provided by vendors as requested, it is often offered under an agreement of confidentiality. Therefore, vendor rankings based on revenue figures should be viewed as approximations.

B
Industry Structure

For purposes of this report, the U.S. banking and finance industry (which does not include the insurance sector, the subject of a separate INPUT report: *Industry Sector Markets, 1992 - 1997—Insurance)* will be segmented as shown in Exhibit I-1.

EXHIBIT I-1

Banking and Finance Industry Segmentation and SIC Codes

- Commercial banks (602)
  - Money centers and large banks
    - Assets over 5 billion
  - Regional and midsized banks
    - Assets between $1 billion and $5 billion
  - Small commercial banks
- Saving and loan institutions (603)
- Credit unions (606)
- Brokerages and other financial services firms (62X)

The U.S. banking and finance industry, outlined demographically in Exhibit I-2, is highly concentrated. For example, although there are about 12,000 commercial banks in total, approximately 70% of all commercial banking assets are controlled by the 100 largest bank holding companies. With the recent rise of so-called "super-regional banks" (see Chapter II), however, the concentration has been somewhat less at the very top of the industry. For example, in 1975, the 10 largest money center commercial banks controlled 28% of all deposits. By 1989, that level of control dropped to 20%; and now mergers and acquisitions, especially among the largest banks, are again changing the structure of the industry. Some banking industry observers, in fact, expect to see $300 billion to $400 billion giants by the end of the 1990s, reversing the 1975-1989 trend.

Total employment in the industry in 1988 stood at about 3 million, almost half of whom worked for banks. Growth in employment dropped to 0.6% in 1989, down from 1.8% in 1988 and 4.4% in 1987.

EXHIBIT I-2

U.S. Banking and Finance Industry Demographics

Segment	Number of Institutions	Total Assets ($ Billions)
Commercial banks	12,000	3,500
Saving and loan institutions	2,500	1,300
Credit unions	14,000	175
Brokerages and other financial services firms	N/A	1,500

Note: All numbers rounded

C
Organization and Contents of Report

The remainder of this report is organized as follows:

- Chapter II—Trends, Events, and Issues—provides background information on the business issues and trends that are driving the use of information services within the banking and finance industry.

  The section on trends and events focuses on two areas:

  - The impacts of general business trends, such as globalization of markets, competitive changes, organizational restructuring, and the continuing use of technology to change basic operational practices and to achieve competitive advantage

  - Banking and finance industry-specific trends and events, including profitability issues, restrictions on the banking business, competition, overcapacity, mergers, and other topics

  The section on issues identifies specific questions that should be asked and situations that should be addressed in developing a business strategy to provide information services to one or more segments of the banking and finance industry.

- Chapter III—Information Systems Environment—provides an overview of the basic business processes in the banking and finance industry and their supporting information system applications. For example, a discussion of how the banking and finance industry uses information systems to operate and manage its business activities is included. Networks and data communications are included in this analysis.

The impact of new and emerging technologies on applications and IS organizations is addressed, as are organizational and budgetary considerations.

- Chapter IV—Information Services Market—looks at the banking and finance industry from two viewpoints:

  - By delivery mode: How are these services delivered? INPUT's delivery modes for the banking and finance sector are:

    · Processing services
    · Turnkey systems
    · Applications software products
    · Systems operations
    · Systems integration
    · Professional services
    · Network services

  - By industry segment: Who is buying information services? In other words, what segments within the banking and finance industries are buying services in which delivery modes?

    Overall market forecasts are provided by delivery mode and industry segment.

- Chapter V—Competitive Environment—identifies leading IS vendors in the industry, discusses some of the factors that affect the competitive dynamics of the industry, and profiles representative vendors.

- Chapter VI—Conclusions and Recommendations—reviews the trends and opportunities described in the report and provides recommendations for vendors as well as users.

In addition, there are two appendixes:

- Appendix A presents industry-specific definitions.

- Appendix B presents the forecast data base and reconciliation.

The forecast data base contains a yearly (1992-1997) forecast of user expenditures by delivery mode for the banking and finance industry as a whole, and for each industry segment. The forecast reconciliation compares this report's forecast with the forecast provided in INPUT's previous banking and finance industry report and explains the reasons for any major differences.

Trends, Events, and Issues

This chapter discusses trends, events, and issues in the banking and finance industry.

Section A, Trends and Events, highlights the economic, business and political forces—as well as key technology trends—driving the banking and finance industry, and shows how the industry is responding to these forces.

Section B, Business Issues, identifies specific questions that should be asked and situations that should be addressed by IS vendors in developing a business strategy that is responsive to the industry trends discussed in Section A.

A
Trends and Events

1. General Business Trends

The year 1991 was one in which the recession was expected to end, the recovery to start, and the ambiguities of an uncertain economy to gradually disappear. The end of the Middle East crisis brought a brief euphoria as American troops, victorious in Iraq, returned home to hopes that the end of the conflict would "jump-start" the economy. Some encouraging signs were seen, but by year-end 1991, the U.S. economy was still sluggish, with no clear signs of a near-term sustainable recovery. Phrases such as "all the necessary pieces to initiate and sustain a recovery are in place," have been common in the media, but as of early 1992, the hoped-for upturn in the economy is yet to be seen. Few disagree that a return to economic growth will happen, but opinions vary widely as to when the turnaround will occur, how quickly the economy will rebound and what the new growth rates will be for the country, the various industries and the financial resources that fuel the economy. Most analysts do agree on one thing, however—American workers' faith in the economy, as demon-

strated by their willingness to spend and invest. Their motivation to compete in the world and domestic markets, demonstrated by the quality of their work products, will have a major role in igniting and fueling the recovery when it does occur.

Recovered or not, however, the U.S. economy is still active and is the major factor in world commerce. As such, a number of national and international business trends continue to impact the banking and finance industry in general, as summarized in Exhibit II-1.

EXHIBIT II-1

Impacts of Business Trends

- 1990-1992 recession in the U.S.
- Global financial services competition
- Third-world debt
- 1980s takeover/LBO-based junk bond debt
- 1989-1992 "rolling recession" in real estate
- Europe 1992

1990-1992 Recession in the U.S. - Official or unofficial, recession in the U.S. finally ended a decade of largely uninterrupted economic growth. As noted below, junk bond debt was one of the first 1990-1991 casualties of the slowdown. The slowdown also raised the rate of business bankruptcies and imperiled banks' portfolios of loans outstanding. Despite this, financial services companies did record a recovery in 1991, as a result of falling interest rates that benefited spread-sensitive institutions such as thrifts and banks, and a stock market that recorded record highs, benefiting brokerage firms, investors and the equity and bond markets. Although much of the data is not yet available for 1991, Exhibit II-2 shows the changes in the banking and finance marketplace from 1970 through 1990. In 1992, the interest rates for the first six entries in the exhibit have maintained their decline to multiyear lows, continuing the trend from 1980 to 1990. Security indexes, on the other hand, have been almost ballistic in their growth, with the Dow exceeding 3,200 in January 1992.

EXHIBIT II-2

Banking and Finance Marketplace
Key Indicators of Market Performance and Activity

Activity	1970 (Percent)	1980 (Percent)	1990 (Percent)
Fed. Res. Bank of NY Discount Rates	N/A	13.00	6.50
Federal Funds, Eff. Rate	7.18	13.36	8.10
Prime Rate (banks)	7.91	15.27	10.01
Large 3-Month CDs	7.56	13.07	8.15
1-Year T-Bills	6.48	10.89	7.35
New Home Mortgage	8.52	13.95	10.08
Security Indexes:			
- S & P Common	83.20	118.70	334.60
- NYSE Finance	54.60	64.30	133.20
- American Common	48.30	150.60	338.40
- NASDAQ Banks	N/A	118.40	391.00 *
- Dow Jones Composite	243.90	328.20	965.20
Market value: All Sales, All Exchanges	$136 B	$522 B	$2,004 B

Source: *U.S. Statistical Abstract*, 1991 * 1989, 1990 N/A

Global Competition - The increasingly global level of competition facing many U.S. industries is a key business trend for the banking and finance industry as well. Although the largest U.S. money center banks for years have provided a variety of banking services overseas, during the 1980s the reverse became true in two ways. First there was an expansion of the trend that began with the oil shocks of the 1970s when Middle East nations enjoying a trade surplus with the U.S. invested their petrodollars in U.S. property, corporate debt, and government securities. During the 1980s, countries with hard-goods trading surpluses with the U.S.—in particular, Japan—made parallel investments. Such investments helped support debt financing of ballooning U.S. federal government deficits and the overseas trade deficit. Second, Japanese banks for the first time became aggressive acquirers of U.S. banks. One indicator of the increas-

ingly global nature of banking, and the impact is has on the financial community, is the emergence of strong foreign banks to challenge the major U.S. institutions. Exhibit II-3 examines, over a twenty-year period, the 500 largest banks in the world, and notes the declining percentage of U.S. banks in both number of institutions and assets held. This change is not so much an indicator of weakness in the U.S. banking system as it is the logical outgrowth of stronger European, Far East and Near East economies, various trade imbalances and, in some cases, foreign banks that flourish under strong government support.

EXHIBIT II-3

500 Largest Banks in the World by Location of Bank

	Percentages as of		
	1970	1980	1990
Number of Banks:			
U.S. banks	37.0	18.6	21.6
Foreign banks	63.0	81.4	78.4
Assets in Banks:			
U.S. banks	33.3	15.1	10.0
Foreign banks	66.7	84.9	90.0

Source: *U.S. Statistical Abstract*, 1991

Third-World Debt - High levels of third-world debt continue to impact U.S. banks, especially the large money center banks. For several years in the late 1980s and continuing in some cases through 1990 and into 1991, many banks with heavy exposures to debt held by less-developed countries—especially in South America—went through one or more write-downs of portions of this debt. Some write-downs were self-initiated and some were mandated by U.S. regulators. Banks now realistically anticipate that some or all of this over-extension of credit will never be repaid. Foreign lending by U.S. banks is not limited to just third-world countries, however. Exhibit II-4 summarizes the loans made by large U.S. banks to the four largest borrowers of such funds as of 1989—an amount equal to 40% of all such foreign loans. As the chart notes, although Brazil and Mexico together accounted for 15% of U.S. large bank loans, the U.K. alone borrowed almost that much, and Japan was responsible for more than 10% of the loan balance.

EXHIBIT II-4

Foreign Lending by Large U.S. Banks
Largest Borrowers, 1989

Country	Amount ($ Billions)	Percent of Total
United Kingdom	31.5	14.6
Japan	21.8	10.1
Brazil	16.3	7.5
Mexico	16.1	7.5
All others	130.3	60.3

Source: *U.S. Statistical Abstract*, 1991

Junk-Bond Debt - The 1980s excesses in the issuance of junk-bond debt to finance corporate takeovers and leveraged buyouts became accountable in the early 1990s, especially as the economic slowdown cut the ability to service the debt undertaken. The result was bankruptcy in some cases and substantial restructuring of the debt in others. Either case impacted banks, savings and loans, and brokerages with substantial junk-bond holdings. In some instances, the debt was swapped for equity in the firms, increasing the debt holders' asset base but cutting their anticipated high rates of (junk-bond) interest return.

"Rolling Recession" in Real Estate - Starting in 1989, well before a generalized recession was widely acknowledged, U.S. banks—especially savings and loans—saw a clear and negative regional pattern: a rolling recession in real estate values, starting in the Southwest oil-patch and the Northeast industrial sectors, and moving into the Southeast, the Mid-Atlantic states, and even the golden California real estate market. Financial institutions (as opposed to the nonbank financial sector), by law, are restricted to a single state or to a largely regional economic base. Thus, each regional roll-down of real estate values meant that substantial portions of the region's banks' asset portfolios were placed in jeopardy at the same time, which simultaneously weakened the collection of interest and the ability to profitably sell failed properties. Despite attempts by the Fed to stimulate home sales through reduced interest rates, the housing market, with a few small exceptions, remains depressed. New home sales and resales are stalled for lack of consumer (buyer) interest, even though prices (offered by desperate sellers) have dropped to 3-5-year lows in some areas. Many homeowners, however, have taken advantage of the low interest rates to refinance homes (purchased in the 1980s) that had high fixed or variable-rate mortgages.

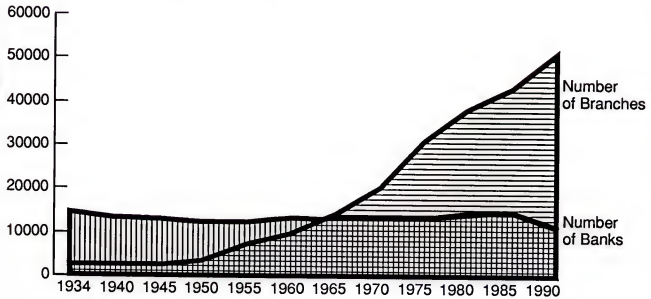
Europe 1992 - Finally, the march toward European trade unification in 1992 continues (albeit with uncertainty about monetary union and the strength of the newly unified German economy) and thereby raises flags of uncertainty about the likely impacts on international trade and finance. Two feared impacts are restrictions on the ability of U.S.-based financial firms to compete in Europe and the possibility of stronger European firms' pushing into the U.S. market.

2. Banking and Finance Industry Trends and Events

The period since the late 1950s has been one of mixed growth for insured commercial banks, as noted in Exhibits II-5 and II-6. In terms of the total number of banks, there has been a very gradual decline since 1934, accelerating from 14,435 banks in 1980 to a 56-year low of 12,338 in 1990. Branches, on the other hand, have grown steadily from the early 1950s to more than 51,000 in 1990. Exhibit II-5 offers a 56-year record of bank and branch growth.

EXHIBIT II-5

Insured Commercial Banks and Branches
1934 to 1990*



* Beginning in 1982, remote service facilities (ATMs) are not included in the count of total branches. At the end of 1981, there were 3,000 such facilities

Source: FDIC - 1991

Exhibit II-6 summarizes the changes in a number of bank attributes from 1980 to 1990. The one thing that is immediately obvious is that the 1980s was a period of volatility for commercial banks. New bank charters dropped by 20% from 1980, while mergers and consolidations and the number of multibank holding companies tripled. The number of bank failures was 16 times greater in 1990 than it was in 1980, even though the number of banks had declined by 15%.

EXHIBIT II-6

Insured Commercial Banks
Changing Environment, 1980-1990

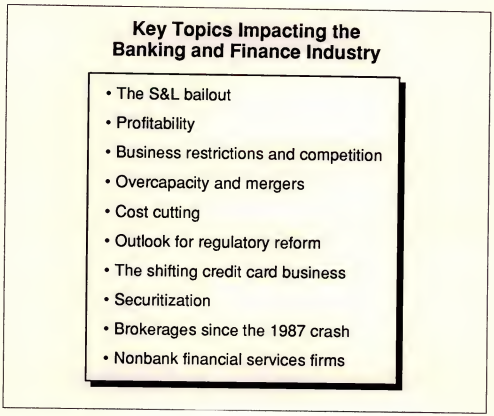
Attribute	1980	1990	Change
New charters	205	165	Down 20%
Consolidated, absorbed, merged	132	390	Tripled
Failures	10	159	16 Times
Number of banks	14,435	12,338	Down 15%
Number of branches	38,736	51,225	Up 32%
Multibank holding companies	284	831	Tripled
Banks owned by holding companies	2,269	3,780	Up 67%

Source: *ABA Banking Journal*, 1991

What is obvious is that the last decade is one in which a great number of changes have occurred in the financial services marketplace. And the last decade of this millennium is one in which such changes will continue to occur.

The mix of key trends and events affecting the U.S. banking and finance industry in the late 1980s and early 1990s can be addressed in terms of the 10 major topics shown in Exhibit II-7.

EXHIBIT II-7



a. The S&L Bailout

During 1990 and 1991, American taxpayers have watched as the federal government's management of the bailout of insolvent savings and loan institutions (S&Ls) has faltered repeatedly and current and forecast costs have mushroomed. S&L investments in junk bonds and real estate, which are guaranteed against loss to depositors by federal deposit insurance, now imperil an estimated 600 to 800 of the 2,500 S&Ls. Forecasts now range up to $500 billion or more in ultimate costs, including interest.

As a result of the bailout—and especially its ever-expanding costs—a cloud of depositor fear and uncertainty hovers over the entire U.S. banking industry. Without fully understanding the dynamics, citizens watch uneasily as many still-solvent S&Ls sell assets to meet new capitalization requirements and slash costs to bring back profitability. Many banks are buying S&Ls, often with government financial assistance, as the price of keeping the obligations to depositors in private hands.

Early in 1991, the press began to ask if commercial banks would be next. The U.S. Congress—and the banking industry—quickly moved to assure that no bank bailout would be necessary. Nervousness mounted, however, as the increasingly weak New England banking market saw banks with assets of $29 billion—led by Bank of New England—fail during the first

five months of 1991. In reaction, the banking industry offered its own plan to strengthen the funding of the Federal Deposit Insurance Fund (FDIC) insurance safety net for depositors. Many banks and analysts continue to protest that comparison to the S&L situation is unfair. Commercial banks, they argue, have broader lending bases in business and consumer loans, as well as the more-risky real estate lending. Also, commercial banks today derive an increasing proportion of their income from fees charged on services, such as trust and cash management. Analysts point out that during 1990 "only" $7 billion was recorded in commercial-bank charges against the FDIC insurance fund; this amount, they argue, is minor compared to $500 billion in anticipated S&L bailout costs. The comparison is reassuring, but the uncertainty remains and the recent low rates on deposits is motivating many bank customers to seek alternative investments.

b. Profitability

Banking profitability for the ten largest multinational banks (measured as return on equity) rose to 8.2%% in 1991. Profitability for the top 25 regional banks was significantly higher, at better than 14.8%. In 1990, measured on total assets of $3.5 trillion, the banks earned only $16.6 billion—less than one-half of one percent. A contributing factor was the fact that the 1987-1990 period saw significant cuts in the profits of many money center banks, because of increases in bank reserves for uncollectible debts in less-developed countries. Industrywide profitability dropped in 1989 and 1990 due to defaults on (and expanded loan loss provisions for) high levels of commercial real estate lending in regional markets that are now overbuilt.

To place the 1991 numbers in perspective, in 1990 even the top 100 banks averaged only a 6.5% return on equity (although a few leaders earned over 20%) and in 1989 this rate was 5.6%. Some analysts note that the community banking sector remains relatively insulated, so far, from the problems affecting other financial institutions in the late 1980s and early 1990s, having concentrated on local business lending during that period and avoided the speculative excesses now dogging the S&Ls and midsized regional banks. For all banks in general, however, loan demand reportedly continues to be soft in the 1990-1992 recession, with only isolated signs of a pickup.

A concern is a long-range acceleration in the number of bank failures: more than 1,000 banks have failed in the past 10 years, versus just 500 bank failures in the 46 years from 1934 to 1980! In the last five years the acceleration has been more obvious, reaching a high of 221 failures in 1988. In 1989 that number dropped to 206 and in 1990 to 159, hopefully signaling a trend toward greater stability. Combining S&L and commercial-bank failure statistics brings out a highly regional pattern: in 1988-1990, there were over 600 failures in the Southwest, versus a total of about 350 in all other regions of the U.S.

To prevent an S&L "replay" in commercial banks, the FDIC insurance fund reportedly needed a short-term infusion of $70 billion or more to stay solvent in 1991—although, even with that addition, only a small percentage of deposit obligations are actually covered. A continuing debate in the industry, and in Washington, centers on FDIC funding and the various mechanisms to achieve adequate FDIC coverage. Banks appear committed, however, to assessing themselves additional FDIC insurance fees to assure fund solvency.

c. Business Restrictions and Competition

Banking Product Options - Until very recently, banks have remained largely restricted by the 1933 Glass-Steagall Act from diversifying beyond basic banking functions, even into related financial businesses such as mutual funds, insurance, and real estate. For this and other reasons, many money center, S&L, and commercial banks resorted during the 1980s to higher-risk third-world and real estate lending to try to boost profits.

The sentiment of the Glass-Steagall Act may now be changing. A recent state action in Delaware (since challenged by the Federal Reserve) opens the opportunity for banks or banking subsidiaries chartered in that state to sell and underwrite insurance within the state and perhaps nationwide. Florida and Illinois, however, have turned back similar efforts. Based on court interpretations, banks already have the power to undertake asset-based underwriting (backed, for example, by credit card receivables). In addition, banks are now starting to win approval for equity-securities underwriting, which the Federal Reserve first granted to J.P. Morgan in 1990; other major banks have now applied. In an interesting competitive twist, stock brokerage firms now want corresponding authority to enter the banking business, or at least access to the Federal Reserve's discount window for emergency borrowing in liquidity crises.

Nonbank Funding Sources - One of the biggest changes to the banking business in the past decade is the availability to corporate borrowers of many nonbank sources of funds. Funding options are available from insurance companies and commercial credit sources, and there is a vastly expanded commercial paper market, aided by Wall Street brokerage and investment banking houses.

In addition to simple lending, a wider range of bank-like services is available from largely unregulated competitors like General Electric, Sears Roebuck, General Motors, and American Express. Recent profits at GE Capital Corp. decreased due to losses on highly leveraged loans, but this sector shows few such problems compared to many banks and S&Ls.

Money-Market Funds - One of the strongest challenges to the traditional deposit business of the banks is coming from ever-stronger money market funds, which increasingly succeed in drawing basic deposits and certificate-of-deposit funds from banks. Money market funds tend to offer return rates 0.5% or more higher than bank rates because money market

costs are lower due to the lack of branch-bank costs, deposit-insurance fees, and regulatory requirements to hold reserves against deposits. Increasingly, the money-market funds offer check-based withdrawal options and credit cards (actually *debit* cards, since account balances are debited automatically, although overdrafts can be treated as margins against CMA-held securities). Some ATM-based access options are also anticipated.

International Issues - U.S. banks now face foreign banks and finance entities that increasingly compete for U.S. lending business. *The Wall Street Journal* (6/6/91) reported that "foreign and foreign-owned banks made more than 30% of all business loans in the U.S. last year" and controlled 21% of U.S. banking assets and 14% of deposits. Given continued restrictions on U.S. banks as to geographic coverage and nonbanking activities, most of the largest U.S. money center banks rank below top foreign banks in size and scope (see Exhibit II-3). Thus, the international competitive strength of U.S. banks is limited. Today, many U.S. money center banks are decreasing their reliance on institutional and foreign deposits that can quickly move out in a crisis. Rather, such banks are emphasizing more stable consumer deposits, and some have grown (for example, Bank of America) by acquiring deposits of failed thrifts. In parallel, banks are expanding consumer banking services to raise fee income.

d. Overcapacity and Mergers

With the rise of alternative sources for lending and new opportunities for relatively high returns on deposits—and continuing restrictions on alternative business ventures—some analysts draw a picture of a traditional, local-based banking industry being overwhelmed by change. They say that 12,000 banks are too many for the new realities of the U.S. financial business.

As evidence, many cite the rapid consolidation in the midsized sector of the business since a 1985 Supreme Court ruling permitted a state to make local reciprocal banking agreements with other nearby states. Consolidation has given rise to a new class of super-regional banks that were built up through mergers and acquisitions. To date, money center banks have been excluded from such agreements because states view such banks as too powerful. Some expect this resistance to erode soon, however, as states permit acquisitions from out of the region. Wider geographic arrangements may still prove limited, however, because the cost economies are far greater on an intraregional deal, where operations can be centralized without being far from either player.

In his 1992 "State of the Union" speech, President Bush proposed a broad range of remedies to stimulate the economy, one of which was a rekindled interest in national banking. Should it become easier for banks to cross state boundaries and grow where markets dictate, the rate of mergers, acquisitions and consolidations will almost surely accelerate.

In 1991, merger activity continued, with the most prominent courtship being that of Bank of America for Security Pacific. BofA is expected to consummate its $4.4 billion acquisition of Security Pacific in early 1992, and the resulting bank, with over $190 billion in assets, will be one of the largest in the world, and second in size in the U.S. to Citicorp ($215 billion in assets). Most mergers have resulted in closing of duplicate branches and heavy staff cuts, and thus strong local opposition has been common. Such opposition, however, has not seemed to slow the pace of mergers and acquisitions at all, and many predict that by the turn of the millennium, $300 billion and $400 billion banking giants will dominate the economy.

Despite local opposition, it seems especially likely that in the future there will be more acquisitions of midsized banks (with assets in the $1 billion to $10 billion range) by recently established or new super-regionals. Such mergers clearly can be rational from a cost-cutting standpoint. Once merged, the larger institution's competitive position can be improved by the opportunity to offer a broader range of banking services and to spread the cost of more-sophisticated computer systems over a broader base. On the negative side, in terms of local and human impacts, some see as many as three-quarters of a million bank employees laid off through such mergers in the next decade.

This raises a key policy consideration: that of managing the transition of the banking industry out of overcapacity more effectively than the S&L excesses (and, perhaps, overcapacity) have been managed to date. Some note that the current administration's plan for reforming banking regulations would permit rational, businesslike exits from banking in a time of overcapacity and permit banks to reapply capital to other businesses, much as the steel industry has done in recent years. In this way, not all banks would be forced by restrictions into holding on and fighting for shares of a declining market. If such a competitive climate were to occur, many banks could fail at taxpayer expense.

e. Cost Cutting

Against the financial and competitive backdrop just outlined, it is scarcely surprising that cost pressures in general and cost cutting in particular are primary issues for almost all banks today. Under the profit center concept, controlling and reducing costs of operations across all bank activities has become the norm, and one route is the merger wave described above. In the Bank of America-Security Pacific merger, BofA's stated goal is to cut

operating costs by $1 billion within 3 years, with $300 million to $500 million reportedly coming from a consolidation of data processing resources. More generally, the costs of information systems and services are being scrutinized ever more carefully by cost-cutting bank management.

f. Outlook for Regulatory Reform

As alluded to earlier, banking regulatory reform looks inevitable in some form, although the final shape is anything but clear. The following paragraphs examine some of the more important regulatory activity.

Capital Ratios - The major banking industry regulatory change to date (beyond the S&L bailout structure) is that banks' capital-reserve requirements have been raised significantly, which cuts the total volume of loanable funds. Banks at all levels are under increased-capital-ratio regulatory mandates.

In the case of industry giant Citicorp, for example, the target is to raise capital levels by as much as $5 billion. In addition to slashing expenses so that increased profits can be fed into the bank's capital base, Citicorp reportedly wants to raise $1.5 billion through the securities market, with perhaps another $1 billion coming from a new issue of common stock.

Through issues of equities and bonds, banks raised almost $5 billion in new capital during just the first quarter of 1991. For banks at all levels, the outlook is that regulators will require further increases in capital ratios.

Federal Proposals - As the nation enters an election year, the Bush administration has proposed a wide range of commercial banking reforms. Proposals in 1991 included substantial bank participation in securities underwriting, insurance, and even nonfinancial businesses (permitting institutions to make an orderly exit from banking in a time of overcapacity); interstate banking; limited reform of deposit insurance to shift risk from the FDIC government fund (and thus the taxpayers) to bank shareholders; and elimination of or limits on insurance for brokered deposits. Also proposed were radical separation of deposit and lending functions, especially to shield insured deposit funds from risky lending, and the basing of deposit insurance premiums on the riskiness of the loan portfolio, perhaps through privatization of the deposit insurance system. Considering the implication of wide-ranging reforms, some believe the banks' broad base of branches would be the ideal distribution system for other financial products.

Congressional Action - Although wide-ranging banking industry regulation reforms were proposed in 1991, little congressional action on the proposals was seen. Indeed, many doubt that significant reform legislation will pass in 1992. Robert Glauber, widely regarded as the author of the White House's 1991 "Modernizing the Financial System" prescription for

the banking industry, believes that 1991 was a year of banking education for Congress, and that although there were pressures from various lobbies, none was strong enough to get anything done. In any case, the most likely reform to find its way into law in 1992 will be interstate banking—an action that could occur independently of any other legislation.

FDIC Status - Hovering over all the proposals is a major short-term worry: the balance in the FDIC insurance fund has dropped from over $18 billion at the end of 1987 (to cover $1.6 trillion in deposits at that time) to just $10 billion at the end of 1990 (to cover $2 trillion in deposits now). As noted earlier, the commercial banks appear to be agreeing to further fund the FDIC. Increased funding will also be beneficial to the banks in distancing themselves from the S&L bailout's impact on taxpayers. On this issue and on the larger issue of regulatory control of the S&Ls and the commercial banks, however, there is ongoing political debate on the future roles of the Federal Reserve, the Treasury, the Comptroller of the Currency, and other current or future regulatory bodies.

Credit Unions - There is also a possible side effect of proposed banking industry reform that some argue is a conscious plan by banks, but others see as an unintended impact: proposed regulations that would increase costs for the nonprofit, generally local credit unions by making changes in how they account for deposit-insurance premiums versus assets. The regulations would eliminate a cost advantage that such institutions now have over banks and S&Ls. Credit union members, of course, are lobbying hard against this provision.

g. The Shifting Credit Card Business

Scope of the Credit Card Market - Few outside the industry realize how important a financial force credit cards have become. They now account for 30% of all consumer borrowing, with over $360 billion in billings in 1990. Yet, as indicated in Exhibit II-8, half of the top-used credit cards are issued by nonbanks.

Nonbank Presence - Overall, the credit card business is less and less controlled by banks: the nonbank share of card receivables had risen to 16% in 1990. Yet, for the big-bank players, credit cards are a major and important business. In 1990 the card business represented 69% of Citibank's profit. Among banks, credit cards are increasingly a big-bank service. The trend has been for small and midsized banks to sell their credit card businesses and apply capital and reserves elsewhere.

EXHIBIT II-8

1990 Billings of Top Credit Card Issuers

	($ Billions)
American Express	88.3
Citibank	40.3
Sears Discover	19.4
Sears Roebuck	16.8
First Chicago	13.0
Chase Manhattan	11.4
MBNA*	11.0
Bank of America	10.4
J.C. Penney	8.7
AT&T Universal	4.4

* Formerly MNC Financial

Source: *Business Week* 1991

Exhibit II-9 notes the percentage of general-purpose credit cards issued by major institutions over the period 1988 to 1990. The percentage of the market held by the three largest issuers (Greenwood Trust/Discover, Citicorp and American Express) has steadily increased, from 28.6% in 1988 to 32% in 1990, a growth of almost 12%. During that same period, the number of general-purpose cards in circulation grew by almost 15%.

EXHIBIT II-9

General-Purpose Credit Cards

	1988	1989	1990
Total U.S.-held general-purpose cards (Millions)	256.7	272.5	294.5
Percent of market held by sixteen largest issuers	46.7	52.0	56.7
Percent of market held by three largest issuers	286.6	30.8	32.0

Source: *ABA Banking Journal*, 1991

Among the nonbanks, the successful upstarts include Sears' Discover Card and, more recently, AT&T's Universal Card. The latter has already captured 8.5 million active cardholders and is still growing fast, with over $4 billion in 1990 billings. In addition, there are many other nonbank-issued cards, including special-interest cards that often pay dividends to chosen causes.

h. Securitization

An important trend impacting banks and nonbanks in the financial services industry is the increasing trend toward securitization—the packaging for reselling and/or trading of blocks of loans of all types. The lending agency that packages loans in this way earns a fee for the packaging and moves loans off the financial books, thus freeing the capital for lending—and securitizing—once again.

In fact, a major reason for the S&Ls' loss of mortgage business has been the increasingly widespread securitization of mortgages through GNMAE, FNMAE, and others, thus permitting low-capital mortgage brokers and others to compete easily, often under lower cost structures.

i. Brokerages

As CD rates dropped below 5%, small and large investors turned to stocks and bonds, pushing the Dow over the 3,000 mark. There were also many new issues, and the final count of capital raised in 1991 could be as high as $15 billion. Exhibit II-2 noted the changes in various security indexes from 1970 to 1990. In 1991, for the first 11 months, further gains were reported for all indexes, and the S&P brokerage stock index doubled. In general, retail brokers did very well. Not surprisingly, though, the long-term, multiyear trend of decreased trading volume (despite the recent upswing) means continued tight budgets for brokerages' spending on information systems and services. Brokerages are emphasizing efficient use of installed systems, not big investments in new systems.

j. Nonbank Financial Services Firms

As mentioned in several of the subsections above, a strong new class of banking industry competitors is emerging: nonbank financial services firms. Whether in credit cards, lending, or nondepository interest-bearing accounts such as money market funds, more and more nonbank institutions serve the financial needs of individuals and businesses today. These institutions generally are well capitalized—often by industrial-sector parent firms—and generally operate free of most of the regulatory constraints imposed on banks and S&Ls. There is every reason to believe that nonbanks will continue to win business from traditional banking firms in the future—and thus will invest relatively more heavily than the rest of the sector in information systems and information services.

3. Technology Trends Impacting the Banking and Finance Industry

Exhibit II-10 summarizes the information technology issues facing the banking and finance industry in the 1990s.

EXHIBIT II-10

Information Technology Issues for the Banking and Finance Industry

- Established technologies
- Imaging
- Expert systems
- Downsizing and outsourcing
- Disaster recovery
- Distributed systems and integrated data bases
- Communications
- EDI
- Workstations
- Home/remote banking
- Debit cards and smart cards

a. Established Technologies

A number of information technologies are already well established in the banking and finance industry. The most significant of these are noted below and share a common attribute: each automates a traditionally labor-intensive function, improving both service to the customer and financial institution labor costs.

Platform Automation - The value of platform automation is now almost universally accepted in the banking industry; the technology is in wide-spread use now, after a relatively slow start. This technology cuts costs by allowing each bank teller to capture every transaction directly and immediately as an on-line function, not at the end of the day as a batch operation.

Voice Response - Similarly, it is becoming very common for banks, brokerage firms, and other financial institutions to use voice response systems to allow customers to obtain balances, records of checks cashed and deposits, and other information from touch-tone phones.

ATMs - ATMs are now accepted alternatives to routine transactions with human tellers. Many observers note, however, that any early competitive advantages that banks gained by being ATM pioneers have now evaporated, and ATMs are now essentially a competitive necessity, albeit one that may serve to keep teller and transaction costs somewhat under control. It is ironic, though, that banks now have more ATMs in operation than ever before, yet are keeping branches open with paid staff for longer hours than in the past.

b. Imaging

Imaging is the hot new technology of the 1990s. The following paragraphs discuss the issues relevant to the banking and finance industry's use of imaging technologies.

Motivation - Almost all banks and financial services firms appear to be examining and evaluating imaging at some corporate level. The top attraction appears to be the decreased costs of check handling. Imaged but checkless statements, besides being less costly, may be attractive in luring new banking customers and an advantage in retaining existing ones in the newly competitive deposit and checking arena. To speed paperwork processing, there are also good imaging opportunities in the handling of loan application documents, and virtually all other key business documents.

Costs and Benefits - The stumbling block, especially at this time, is cost. Mainframe-based systems (the size required for mid- to high-volume bank applications) start at $2 million for a stripped system, with a new high-performance system from IBM ranging in price from $10 million to $20 million. (In an interesting alliance between a hardware manufacturer and a consulting service house, Unisys and Cincinnati Bell Information Systems jointly offer an imaging system for check processing.) One estimate is that a bank needs 3 million transactions a month to cost-justify a large image-processing system. The Bank of Boston, for one, believes such costs are justified, albeit for a workstation-based system. The bank reports that an imaging system to automate the management of deposit accounts has resulted in a 40% increase in productivity after a staff cut (through attrition) from 41 to 25.

Standards - To date, few banks are using imaging systems. Among nonbanks, American Express has led the way for several years by using an imaging system based on networked PCs and workstations, not a mainframe. Besides costs, continuing obstacles to imaging's growth include lack of standards and lack of full integration with other banking systems.

c. Expert Systems

Expert systems in banking and finance have proved to be a disappointment. Compared to rosy expectations in the mid-1980s, when the use of artificial intelligence was considered a major future benefit of the application of computer technology to banking needs, there is yet relatively little use of expert systems for lending applications, with somewhat better acceptance for credit scoring. The most extensive use of banking and financial expert systems to date has been by stock brokerages, especially to drive high-speed programmed trading from powerful workstations. But programmed trading, after recent market turbulence, has come under strong scrutiny.

One of the main pioneering uses of expert systems to date has been by American Express, whose workstation-based Authorizer Assistant helps speed approval of credit card purchases. In the future, expert systems technology likely will aid in the monetary union of Europe (assuming the political obstacles involved are overcome), and will minimize the complexities—and business opportunities—of integrating multiple national currencies.

d. Downsizing and Outsourcing

The dominant organizational concepts for the early 1990s are downsizing and outsourcing. Major trends in these areas include:

Consolidations - Late in 1990, Manufacturers Hanover Trust set the pace for cost control through computer-operations downsizing by announcing it would consolidate eight data centers into just two, with major cuts in staff. In the 1991-1992 timeframe, significant mergers include Manufacturers Hanover and Chemical Bank, BankAmerica and Security Pacific, and NCNB and C&S/Sovran. In each of these mergers lies the potential for major consolidations to reduce costs. Other less dramatic examples will certainly occur throughout the next few years.

Processing Services - Given today's cost pressures, banks and processing services vendors report that a far higher proportion of large and midsized banks are considering—and more often implementing—outsourcing of processing to third-party service vendors than in the recent past. Smaller banks, in contrast, increasingly are using recent advances and cost decreases in minicomputer technology to install turnkey systems that eliminate the unit-transaction-based fees charged by processing service vendors.

Systems Operations - In late 1991, Perot Systems agreed to take over the IS function for NCNB, the largest super-regional bank in the U.S. This outsourcing contract is estimated to be worth more than $200 million to Perot over 10 years. Perot will acquire NCNB's Richardson, Texas data

center, as well as a center in Charlotte, North Carolina, and plans to hire approximately 200 NCNB employees. This is an ever-increasing trend in banking—the placing of operational responsibility for computing resources (up to and including the full IS function) in the hands of computing specialists who will satisfy the bank's processing needs on a contract basis. Where the processing function is not relegated to a specialist, frequently a bank will contract with a systems integrator to merge, consolidate, upgrade or otherwise improve the bank's processing environment and resources. Systems integration and systems operations vendors are benefiting from the growing trend to use data processing specialists to manage or advise on the management of the banking DP function.

Changing Demands - The wave of banking mergers and acquisitions is resulting in a new set of requirements and information services opportunities to integrate disparate information systems. Many professional services and systems operations firms now offer such services as part of their packages.

e. Disaster Recovery

Regulations issued by the Federal Reserve Bank and the Comptroller of the Currency now require that banks have comprehensive plans to recover business within eight hours of defined disasters. Thus, vendors anticipate a big increase in business for disaster recovery firms, with some increase estimates ranging as high as 500%. Not surprisingly, the extended August 1990 power outage in Manhattan scared many financial institutions. Citibank alone reported losing $100 million.

f. Distributed Systems and Integrated Data Bases

As in other industries, many midsized banking and finance firms are placing decreasing emphasis on minicomputer-based distribution of information systems functionality and increasing emphasis on local PCs (with or without disks, for security purposes) tied cooperatively into mainframe data bases. Banc One, for example, is implementing 15,000 to 20,000 PCs in cooperative processing with its mainframes.

To support relationship banking, firms are finding RDBMS technology essential for implementing comprehensive, relationship-based customer account records. Banks believe that integrated customer information systems provide competitive advantage by attracting customers (business and personal) with single-statement summaries of financial status and by permitting the bank to cross-sell additional services whenever there is an interaction with the customer. Clearly, such systems require integration of separate account-based data bases. Similarly, RDBMSs are the key to implementing the transition from operational automation to strategic, competitively-oriented information systems, including executive information systems. One interesting note from INPUT's interviews with banks is

that many senior banking executives have yet to endorse the benefits of a carefully-crafted executive information system, and IS executives feel that they still have an uphill battle to implement such applications. Many IS managers feel that a major step forward will be taken when senior bank officers have a terminal or PC on their credenza and use it as a part of their daily activities.

g. Communications

Most banks are increasing their use of local-area networks (LANs), and some banks are now at the stage of integrating multiple LANs and centralizing control and backup operations. Some banks are also integrating LANs with wide-area networks and/or integrated corporate communications networks. There seems to be little movement toward ISDN (integrated systems digital network) communications technology.

h. EFT/EDI

In terms of direct electronic transmission of financial transactions, electronic funds transfer (EFT) is well established among banks, with some advancing further in the automation of money transfer functions, such as the automatic routing of EFT messages.

Some banks expected EDI (electronic data interchange) to follow EFT in the next wave of popular applications. However, in other industries, EDI permits business-to-business financial exchanges by end-user organizations without need for a banking intermediary, thus potentially eroding bank revenues. In addition, EDI acceptance by banks is also limited somewhat by lack of full compatibility among three separate standards, all in use by the banking and finance industry: ANSI X.12, UN/EDIFACT, and the separate standards of the National Automated Clearing House Association. It remains unclear whether banks will move aggressively and try to dominate the financial EDI market, or leave it to other EDI players, both established and new. To date, however, relatively few banks are offering to sell EDI services and/or software to others.

i. Workstations

For several years, high-speed, high-powered workstations have been serving the fast-response, complex needs of specialized brokerage traders, such as those in international currency trading. More recently, workstations have been used in banking for complex functions such as cash management.

Workstation technology will become even more important as international communications-based financial markets—and 24-hour trading opportunities—become reality and step up trading complexity by an order of magnitude.

j. Home/Remote Banking

To date, there has been little market enthusiasm for home-PC-based banking, and many banks have shut down pioneering and experimental systems. The new trend appears to be telephone-based systems, with or without new display telephones.

k. Debit Cards and Smart Cards

Debit cards—debiting the user's bank balance immediately through a communications link—are being explored by banks wanting to cut the float and are resisted by many users for same reason. Predictions vary on whether debit cards will ever replace traditional credit cards. Some see a stronger evolutionary trend in fast-food restaurant experiments, whereby quick and automatic telecommunications inquiries against bad card lists cut waiting time to acceptable levels for small credit card transactions.

As pioneered in Europe, smart cards in the future likely will carry electronic balances on implanted chips, for instant debiting as an alternative to cash.

B
Business Issues

The following is a brief summation of the key business issues and systems opportunities for the banking and finance marketplace discussed in greater detail earlier in this chapter.

Banking and Finance—Key Business Issues

- The lasting effects of the S&L bailout
- International and domestic bad debt
- The continuing impact of the recession
- Lower bank profitability
- Regulatory reform
- Cost controls
- Competition, overcapacity and mergers

Banking and Finance—Key Systems Opportunities

- Downsizing and outsourcing
- Imaging
- Distributed and integrated systems
- Workstations
- New charge card technologies
- Disaster recovery

III

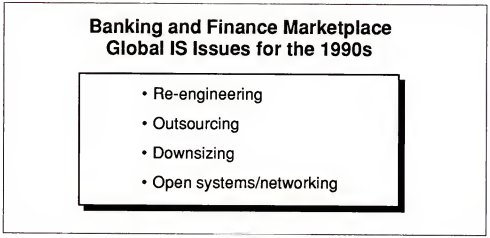
Information Systems Environment

Based largely on primary-research interviews with selected banking and finance firms, plus secondary research using other industry sources, this chapter examines the global issues driving the IS function, outlines how the banking and finance industry uses information systems, and details the key business and technical issues facing information systems management, as well as the impacts of key new technologies. In addition, a review of organizational control of, and budgeting for, information systems provides the foundation for a discussion of key objectives and plans for information systems departments within banking and finance institutions.

A
Global IS Issues

As the industry approaches the middle of the 1990s, four key issues, as noted in Exhibit III-1, are influencing the course of information systems in the bank and finance marketplace and virtually all other industry segments. First are the structured, planned changes that are occurring—a process which can be called re-engineering—in both the industry and the data processing function. This change, being driven by the economy, regulation, technology, competition and other pressures, is forcing most business segments to consider how they have done, are doing and might better do their core business activities Among other considerations, this analysis forces an evaluation of where the IS function is performed, including what portions of it (up to and including the total IS function) can be most cost effectively performed outside the institution via outsourcing. Mergers, consolidations and general budget constraints drive downsizing considerations, to both reduce the inherent redundancies of merged organizations and to trim the organizational excess resources that accumulate during periods of growth and relative technological stability. Finally, open systems and networking are making it easier to become part of the national and global marketplace and take competitive advantage of the many new applications and service offerings that such standards and networking resources encourage.

EXHIBIT III-1



B
IS Environment

Applications Environment - One way to understand the environment in which the IS issues facing the banking and finance industry are taking place is to examine the applications delivered by IS to both the institution for its own internal use, and to the marketplace to support products and services. Although some applications used by banking and finance firms are common to other industries, many listed in Exhibit III-2 are unique to banking and finance.

Another viewpoint of the banking industry can be gained by examining the transaction volumes appropriate to the marketplace. In its 1988 annual report, Bank of America noted the *daily* volumes of items processed by its IS function. Offered as Exhibit III-3, this glimpse into the processing world of banking highlights the huge daily transaction volumes common to the industry. Of interest is the 60.6% of the load represented by demand deposit (check) processing. Although volumes will almost certainly be higher in 1992, the proportions are still probably valid. The magnitude of the check processing activity explains the interest in, if not yet the implementation of, image processing.

EXHIBIT III-2

Key Banking and Finance Industry Information Systems Applications

- Customer information file
- Check processing
- Account reconciliation
- General ledger
- Cost accounting
- Proof of deposit
- Integrated deposit system
- Loan origination
- Loan processing
- Loan syndication
- Loan accounting, tracking, and loss control
- Loan servicing valuation
- Profitability analysis
- Collection and recovery
- Time account processing
- Mortgage origination
- Mortgage processing
- Payroll accounting
- Accounts payable
- Asset/liability management
- Fixed-asset management
- Branch automation
- Telephone inquiry management
- Financial planning
- Investment portfolio management
- Securities accounting
- Equipment leasing
- Vehicle leasing
- Safe-deposit management and accounting
- Shareholder accounting
- Budgeting
- Long-range planning
- Regulatory compliance
- Executive information systems

EXHIBIT III-3

Daily Transaction Volumes
Bank of America, 1988

Item	Count	Percent of Transactions
Checks	12,100,000	60.6
Travelers Check redemption	3,600,000	18.1
Pieces of mail	1,112,000	5.6
Credit/Debit card transactions	995,000	5.0
Consumer deposits	650,000	3.3
ATM transactions	598,000	3.0
Statements	539,000	2.7
Business deposits	220,000	1.1
Customer inquiries	77,000	0.4
Wholesale funds transfers	49,700	0.2
Total transactions	19,940,700	100.0

Source: *Bank of America Annual Report*, 1988

Reaction to the Recession - In response to recession-induced pressures, most banks and financial institutions have, over the last few years, taken steps to either contain or reduce costs. Exhibit III-4 notes actions most commonly applied to the IS function. The consolidation refers to internal efficiencies, as opposed to those resulting from mergers or acquisitions. Decreases in contract programming, layoffs (and attrition), system standardization and reductions (where possible) in maintenance expense are cost-control efficiencies that banking—and virtually all other industry segments—found to be prudent as the economic impacts of the recession affected a larger and larger portion of the economy.

EXHIBIT III-4

Reactions to the Recession
Cost Controls Applied by Banks to the IS Function

- Employed fewer independent programmers
- Reduced internal DP staff
- Standardized on fewer application systems
- Reduced maintenance expenditures
- Consolidated networks
- Consolidated data centers

Source: *Computerworld*, 1991

Cost/Benefit Pressures - Even though bank profitability has improved, few banks have reduced the pressures to control bank costs, including those of information systems. Some critics, in fact, argue that many banking systems investments—ATMs in particular—have lowered bank profits, not raised them, by introducing new costs without corresponding financial benefits. They wonder whether many bank information systems have become costly, competitively required investments that have not provided significant competitive advantages. The emphasis for banking systems investments, now and in the near future, clearly is on demonstrating quantifiable benefits before the money is allocated, and then achieving benefits in practice.

Outsourcing - As a result of cost consciousness and a desire to return to their core business—banking—many more institutions now favor shifting to a processing service or to outside systems operation of data facilities. In addition to direct operating-cost benefits, such arrangements generally free bank capital, which these days must be husbanded carefully in the face of regulators' requirements for higher capital ratios. Exhibit III-5 notes the recent outsourcing arrangements established by five of the top 50 banks. IBM, EDS and Perot Systems are some of the major vendors of such services, and the significance of the outsourcing movement can be demonstrated by the fact that 10% of the largest banks are using it to control costs.

EXHIBIT III-5

Bank Outsourcing

	1990 Fortune 500 Rank	Outsourcing Vendor
NCNB	7	Perot Systems
First Fidelity Bancorp	24	EDS
Continental Bank	26	IBM
Southeast Banking Corp.	44	IBM
First City Bancorp	45	EDS

Source: *Computerworld*, 1991

Downsizing - Some banks are taking advantage of technological advances to downsize from multiple data centers. Relatively few banks so far, however, are undertaking the up-front investment to downsize by moving mainframe-based systems to networked PCs and workstations. In addition to the initial investment, an obstacle to the PC environment is that the kinds of operations now on the mainframe, for most midsized and larger banks, cannot yet be handled effectively on the smaller platforms, even given recent advances in processing power. In part, this is a peripheral limitation. To date, most of the key high-volume peripherals that are integral to banking functions (such as check-processing systems) are available only for mainframe attachment. A new class of such systems—designed specifically for use with networked PCs and workstations—will be required before downsized systems can supplant mainframes in banks.

Technology - Several key technology issues face banking and finance systems managers, with significant business implications. In the cost-controlled environment faced by most banks today, new technological investment is seldom a primary planning topic. The most important issue, typically, is finding new ways to use existing systems more efficiently, including opportunities to downsize operations. However, once the downsizing or outsourcing decision is made, the potentially disruptive impacts must be managed carefully. For instance, some vendors offer a transition service whereby the bank's existing software systems are operated for a time on the processing service's computers, with transition to the service's standard packages taking place in an orderly sequence over time, not all at once.

The apparent short-term exception to limits on systems investment is funding of the transition from older bank data base systems to relational data base systems (RDBMSs). There are several key motivators for this shift. First, in situations where a bank has taken over or merged with one or more other banks, there is the need (near- or long-term) to integrate each bank's separate processing systems. Implementation of an RDBMS can aid this integration. Second, banks historically have kept records on each account for each client separately, with little or no integration. However, integration is required for relationship banking to be successful, and is made feasible by RDBMSs. RDBMS-integrated account records, for example, allow a teller processing a routine checking deposit to note that a customer's 90-day certificate of deposit is due to mature in two days and thus direct the customer to a desk officer who can discuss reinvestment options. Finally, requests for executive information systems, to better manage the business in the competitive environment of the 1990s, generally require RDBMS technology.

Disaster Recovery - As mentioned earlier, disaster recovery is no longer an option—new regulations require it. Most banks are approaching disaster recovery from the standpoint of contracting with outside disaster recovery firms, and in some cases are installing backup power supplies as well.

C
Impact of New Technologies

Some new technologies are affecting the way banking and finance firms design and implement their information systems.

RDBMS - RDBMSs, especially IBM's DB/2, are already installed or are being installed at many large and midsized banks. Given the competition for deposits versus money market funds and other nonbank investments, many banks want to emphasize relationship banking, which takes into account *all* of the customer's business with the bank. Relationship banking makes installation of an RDBMS a competitive necessity.

Imaging - Imaging, in early 1992, appears to be the technology that everyone is familiar with, everyone is studying, but no one has yet fully implemented. Stated another way, although relatively few institutions have implemented such systems (American Express, a nonbank financial institution that pioneered imaging for charge slip records, is a noteworthy exception), several variations are being examined by most sizable banks. Variations include imaging of checks and moving the images to statements (rather than further handling of the paper checks), direct output of lengthy documents (such as daily balances accessed by few bank staffers) to image systems rather than paper, and capturing the many nonstandard documents required for mortgages and other loans in image systems. Two goals for imaging systems are flexible access and the satisfaction of record retention requirements.

The stumbling block for imaging is fixed costs—complete systems range as high as tens of millions of dollars. Today's cost-cutting environment tends not to support such investments without clear proof of short-term payback—which, at this time, is not readily apparent for imaging. In spite of this, however, some industry watchers see a significant growth in the sale of image management systems, as shown in Exhibit III-6. A 28% growth was estimated for 1991, and the forecast for 1993 is a growth of 1,790 units. INPUT feels that these estimates anticipate an improved economy and the reduction of bank IS cost constraints. If these do not occur, the forecast will probably shift ahead a year, with 1992 and 1993 units at 450 and 600, and the strong improvement occurring in 1994.

EXHIBIT III-6

Image Management Systems
Financial Services Marketplace
1990-1993

Year	Financial Services Purchase Forecast (Units)	Change from Prior Year (Percent)
1990	352	-
1991	450	+28%
1993	1,790	+298%
1990-1993 CAGR = 172%		

Source: *Computerworld*, 1991

Expert Systems - In the mid-1980s, many saw expert systems as a bright new systems star for banking, especially for credit scoring, loan authorization, and credit card charge approvals. Although examples of all such applications exist, there appears to be relatively little enthusiasm among banks for moving further with expert systems. A notable exception is the deepening commitment to the Authorizer's Assistant expert system by the nonbank American Express. The bottom line seems to be a lack of documentation of hard-dollar payoffs, and the as yet undemonstrated ability of most systems to deal effectively with enough of an application area to cost-justify their use.

EDI - Electronic data interchange, the direct computer-to-computer transfer of information such as orders and deliveries, as well as financial transfers such as funds and payments, continues steady growth outside of the banking sector. Although all banks routinely use electronic ACH

(Automated Clearing House) facilities and most participate in wire transfers of funds, few banks appear to see themselves in future roles as EDI intermediaries. In part, this pessimism springs from the already-entrenched position of service bureau vendors outside banking, and in part the pessimism may be due to a view that disintermediation—the elimination of middlemen such as banks in financial transactions—is the ultimate goal of EDI and thus is ultimately counter to the banking industry's interests.

The development of a nationwide electronic payment infrastructure in the U.S. banking industry is impeded by the fragmentation of the industry because of regulation. Payment services are profitable when a few large providers serve the entire market. Because the banking industry is fragmented, and the bank's electronic payment systems are not uniform throughout the industry, the infrastructure for payments may take some time to develop. In addition, the market is small, and although it is growing (in terms of volume) at 50% per year, it is still not a lucrative business for banks. As a result, most banks are offering payment services primarily to satisfy important customers, not to make money. At this time, 300 banks have the ability to do EDI processing, and about 50 are actively providing such services. Major providers include First Chicago, Mellon, First National of Detroit, Chase and Wells Fargo.

Workstations - For several years now, high-powered workstations have become the vehicle of choice to execute high-speed, high-profit transactions in such fast-changing brokerage environments as currency trading—or, some would say, workstations are the villain in crash-inducing program trading. As costs drop and workstation power increases, their use for such applications no doubt will accelerate. To date, however, the banking and finance industry has found little other use for workstation technology, and future applications remain unclear—except, of course, to the extent that banks begin to enter the brokerage business.

Tools - Finally, CASE and 4GLs may have noteworthy roles to play in many institutions' evolution from multiple merged-bank systems to integrated systems. CASE in particular will have to deliver more effectively on its longstanding promise to help information systems managers re-engineer old systems before its application will become widespread.

The Future - As budget restrictions disappear and technology continues its functional and performance improvements, the new millennium should see levels of performance that exceed current capabilities by a significant amount. Exhibit III-7 notes Thomas Steiner and Diogo Teixeira's estimate of what the year 2000 will offer in performance improvements for various technologies. Even if only half the improvements are achieved, price/performance ratios will take another giant step up.

EXHIBIT III-7

Changes in Technology Performance Characteristics for the Year 2000
(1990 = 1)

Technology	Year 2000 Performance Improvement
Artificial intelligence	20x
Image processing	10x
Cost per character for rotating storage media	9x
Mainframe MIPs	4x
Relational DBs for transaction processing	3.5x
Mass storage access time	
Software development technologies	1.5x

Source: *Technology in Banking*, Steiner and Teixeira, Dow Jones-Irwin, 1990

D
Organization and Budget

Although banking and finance industry budgets, in general, are highly centralized, many banking firms maintain a split between back-office systems and the computers and equipment that implement field networks of ATMs. Fully decentralized exceptions to this pattern, of course, do exist. Chargeback systems are common but not typical of the majority of firms.

Overall, corporate budgets in general and bank systems budgets in particular are tight. As noted earlier, this pattern holds for brokerages as well, but many nonbank financial services firms are enjoying higher profit levels and are investing more heavily than the sector average in information systems. Industry estimates for 1991 IS growth ranged from 5%-6% for all industry categories, to 3%-6% for banks and financial services. INPUT estimates the 1991 budget growth at 6% and expects 1992 to be at the same rate until a substantial recovery occurs.

According to a 1990 American Bankers Association survey, total IS budgets range from about 8% (midsized banks) to 12% or more (large banks) of total bank operating expenses, excluding interest paid out. INPUT estimates the portion of the IS budget allocated to outside services to be 6%.

E
IS Department Objectives

Based on background and findings presented throughout this report, Exhibit III-8 summarizes the objectives and plans of the banking and finance industry's information systems managers. The exhibit provides guidance for vendors planning products and services for this industry.

EXHIBIT III-8

Objectives and Plans of Information Systems Managers

- Cope with tight budgets and cost controls
- Evaluate and implement outsourcing as appropriate
- Integrate merged-bank systems
- Implement disaster recovery
- Implement RDBMSs
- Support "relationship banking"
- Explore imaging
- Research (only) most other information technologies

Budgets - Vendors selling to information systems managers in the banking and finance industry must keep in mind that although profitability is up, regulatory requirements for higher capital ratios are in force, bankers are paying higher FDIC insurance premiums, and bank IS departments are still motivated to hold costs down. Therefore, budgets continue to be tight and across-the-board cost controls are in place at most banks. Brokerages are in a similar situation, and management is still concerned with costs after waves of post-crash layoffs and other belt tightening. The budgetary bright spots are the less-regulated, nonbank financial services firms. Nonbanks generally have not suffered as much from the recession or from large amounts of poorly performing LBO or real estate loans, and they are

not subject to the extra burdens of mandated capital ratios and increasing FDIC payments. Nonbanks are also more likely than the banks or brokerages to be in growth situations that call for increased investments in information systems and services.

Outsourcing - The bright side of the budget crunch, of course, is that outsourcing continues to be more popular than ever. Banks, in particular, have always been strong users of third-party processing services, and more and more of them are moving beyond routine yearly evaluations of outside processing to taking the action required to shut down costly in-house systems. Increasingly—far more than in the past—they are accepting proposals from a third party to take over data centers and/or other systems operations (and often staffs) in exchange for a long-term contract guaranteeing yearly savings (see Exhibit III-5). This option can prove especially attractive in merger or takeover situations, where the challenge of merging multiple information systems can be beyond the skills or resources of the systems professionals at the controlling firm. This situation has also produced significant opportunities for systems integrators, who can help the bank with complex consolidations or system/application upgrades. There is little indication, however, that nonbank institutions—brokerages or nonbank financial services firms—are particularly open to outsourcing in either form.

Disaster Recovery - As noted, disaster recovery (or contingency) planning for banks is now mandated by mid-1992, so competition—with the potential of sizable winnings for multiple contenders—can be expected for hot sites, cold sites and other such backup services. Note that the mandate also provides opportunities for third-party consulting to plan for disaster recovery and to evaluate various services and other options.

RDBMSs - RDBMs are already in place, being implemented, or being planned by most banks. A main motivator is the assistance RDBMs can provide in integrating records after a merger or takeover. Another motivator is the competitive pressure to offer relationship banking that ties together a client's multiple accounts. In terms of competitive positioning, the client becomes less likely to be lured away by another bank's offer of single statements and other integrated-account services. From the standpoint of service profitability, the bank with records organized in an RDBMS can use the data base connections to spot opportunities and expand the scope of account relationships with its best customers.

Imaging - The new imaging technology is clearly the hot item in the banking and financial services press and is being investigated at some level by most banks. The reality, however, appears to be that funding to purchase such systems—at least those at the top of the line in price and functionality—will be lacking at most banks in the near term. To the extent, however, that vendors can offer small or midsized systems providing payback for specific functions at lesser transaction rates and lower front-end investments, there may be a good short-term market opportunity.

Research - Most leading-edge information technologies will get only research (without development) attention in the short term, because of the tight budgetary situation. As mentioned earlier, the exceptions likely will be found among the nonbank financial services firms, with the possibility of isolated exceptions for specialized functions in the fast-changing world of brokerages. To give some recent examples, American Express leads in imaging implementation and a number of brokerages have pioneered the industry's effective use of networked workstations and expert systems. Similar leading-edge work may be done by these sectors in other new technologies over the next few years, although the prime candidates now appear to be extensions of recent work in those same areas.

Information Services Market

This chapter discusses the market for information services in the banking and finance industry. Information in this chapter draws on statistics presented in Chapter I, and trends and issues discussed in Chapters II and III, to outline anticipated future directions of the market for information services.

One of the key items discussed is the trade-off between prepackaged solutions—such as processing services, applications software, and turnkey systems—and custom solutions that involve consulting or external systems development and systems integration support.

User expenditure forecasts are provided for the banking and finance industry by industry sector and by delivery mode. Assumptions driving the forecasts are presented. Note that these forecasts do not include functional general-purpose information services, such as those supporting the human resources function or generic planning and analysis. The markets for these types of information services are presented in other cross-industry MAP reports, rather than the industry-specific reports.

Section A, Overview, discusses the overall size and growth rate of the banking and finance industry's expenditures for information services.

Section B, Delivery Mode Analysis, breaks out the overall data into INPUT's seven standard delivery modes.

Section C, Industry Segment Analysis, provides a breakout of this same forecast in terms of the major market segments within the banking and finance industry. These segments are:

- Commercial banks
- Savings and loan institutions (S&Ls)
- Credit unions
- Brokerages and other financial services firms

A
Overview

A number of business and technical driving forces will impact the banking and finance industry's use of information services during the next five years. The most important of these are summarized below.

1. Driving Forces

Capital Allocation - The most important force driving many commercial banks and S&Ls toward outside information services is the double-edged squeeze on funds from their generally low-profit positions and the regulatory requirements for higher capital ratios. Switching to either a processing service or an outside systems operator can move a banking institution's capital out of the data processing center and back into the bank's business. Also, many systems operations contracts include guaranteed annual savings over current costs.

Turnkey System Price/Performance - A different information services sector—turnkey systems—is benefitting from recent price/performance advances in minicomputer systems. The advances allow many turnkey vendors to offer midsized—and even small community—financial institutions mainframe-like power for in-house processing at much better hardware prices than in the past. Note, however, that such turnkey business often will come at the expense of the processing services on which such users relied in the past. In the most basic sense, it is this attractively priced in-house processing resource that is driving the "insourcing" trend for small and midsized banks.

RDBMSs - Many commercial banks and S&Ls are finding RDBMSs an opportunistic technology to deal with two key forces—the competitive need to implement relationship banking (which ties together records of all a customer's accounts) and the need to integrate multiple systems and records in the current wave of banking industry mergers. Vendors of the basic RDBMS software environments and of the add-on software packages that extend RDBMS functionality, especially those that work with IBM's DB2, are seeing such new opportunities.

Mergers and Acquisitions - Bank mergers and acquisitions continue to have important impacts on other information services delivery modes. Although processing services vendors may see their usage shrink somewhat as merged or acquired banks bring outside processing in-house to newly merged systems departments, several sectors clearly will benefit from the mergers. Bank system applications software vendors will see acquiring banks take a fresh look at expanded systems needs, often choosing to buy rather than build new and larger systems. Merging banks will seek professional services firms and systems integrators for advice on

systems modification or evolution and for full-scale contracts to integrate old and new systems. Also, systems operations vendors should keep a watchful eye on mergers to identify ripe opportunities to sell the advantages of outsourcing the expanded systems department functions.

Regulatory Compliance - Commercial banks and S&Ls are being driven harder and harder to maintain their systems' compliance with fast-changing banking regulations and reporting requirements. Packaged applications software vendors, processing services vendors, and systems operators can all point out that they offer a central, economical approach to keeping the institution up to date—and in legal compliance—with such changes, so that banks can concentrate on the banking business.

Competition - Nonbank financial services firms will continue to be in relatively strong competitive positions (versus the traditional banking industry) in the near future, unless now-unforeseen new bank-like regulations are imposed. Many nonbanks are already strong users of network and processing services for credit card authorization and transaction processing. Nonbanks will prove to be good customers for:

- Banking applications software adapted to specific nonbank functions
- Professional services to help nonbanks modify software or build custom systems to meet their unique needs
- Integration of new technologies (perhaps even imaging, which nonbanks can better afford than banks can, as demonstrated by American Express) into their systems
- Operating systems in a cost-efficient fashion to keep data processing costs stable even in the face of growing business and systems requirements

2. Inhibiting Forces

In contrast, a number of forces, discussed below, are inhibiting banking and finance firms' use of information services.

Overcapacity - The industry's overall condition of overcapacity has been most obvious to date in the shrinkage of the S&L segment. It is also obvious that the current trend toward commercial bank consolidations will continue for as long as regulatory authorities will allow. Although specific opportunities will emerge from this downsizing of the industry, the absolute number of sales prospects for information services vendors will drop.

Uncertainty - Toughest to deal with will be the uncertainty factor. At least until the federal legislation currently under consideration is either approved or rejected, the future structure of the industry will be in doubt. The implications for the shape of the banking business in the 1990s are profound, and further changes are likely to precede and follow the 1992 presidential and congressional elections. In that environment, caution by bankers can be expected to limit changes in how they manage internal information systems and contract for outside information services. Vendors, in turn, need to be flexible in considering various scenarios and business planning frameworks.

Brokerage Industry - Brokerages are still the industry wild card. Although the recent upswing in the market and the continued high levels of volume and activity have eased most of the post-1987-crash doldrums, many view the future shape of the brokerage business as questionable. Although another long-term expansion and bull market will come sooner or later, it is unlikely to strongly revive employment at—and systems or services investment by—brokerages. Brokerage management will remain cautious for some time. However, brokerages will continue to pioneer the use of technologies like expert systems for specific functions such as currency trading.

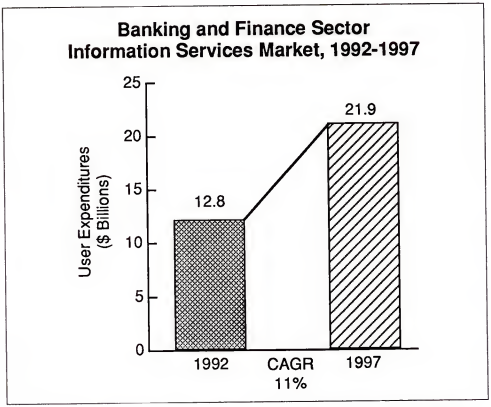
Nonbanks - Similarly, nonbank financial services firms—some affiliated with major industrial firms and some diversified only in financial services—represent another uncertainty for information services firms. Historically, nonbanks have strongly favored in-house solutions, including building their own software rather than buying packages. As noted earlier, generally nonbanks have the advantage over commercial banks and S&Ls of having money to invest in information technologies. Some, notably American Express, have been real pioneers. There have been, however, very few cases where outside information services vendors have successfully penetrated this market and maintained profitable, ongoing relationships.

Based on these driving and inhibiting forces, and other factors detailed below, INPUT projects the 1992-1997 information services market for the banking and finance industry as shown in Exhibit IV-1.

Year-by-year detail is shown in the forecast data base (Appendix B). In addition to the driving and inhibiting forces just outlined and the delivery mode-specific trends outlined in the next section, a number of industry segment-based trends are at work behind this forecast. For example, some commercial banks should experience short-term growth in processing services and systems operations, for the reasons detailed earlier. The S&Ls, however, in general can be expected to be sufficiently preoccupied with their continuing troubles that changes in their use of information services will be more the exception than the rule. The exception will be where pure cost-cutting is the motivator, one result of which could be

increased movement toward processing services and systems operations. Credit unions are already strong users of processing services, and little should change there. The forecast for nonbank financial services firms' use of outside information services is modest for the reasons noted earlier.

EXHIBIT IV-1



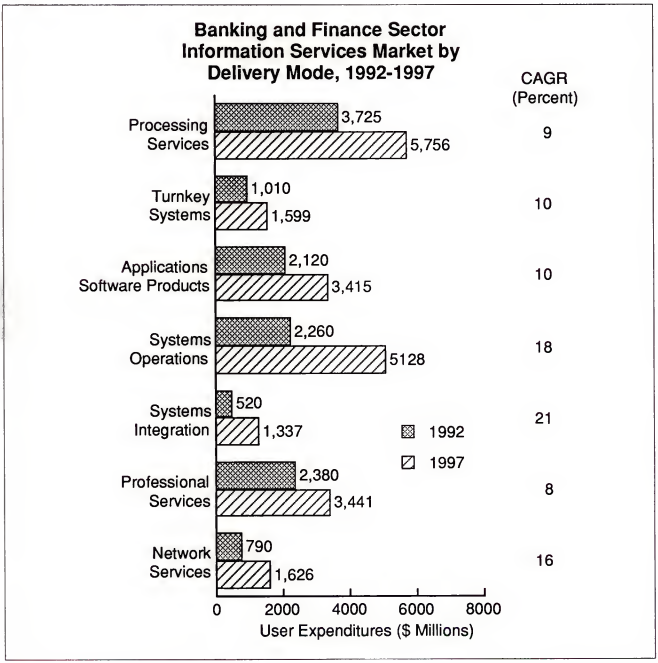
In terms of year-to-year growth rates, there is a general assumption that today's uncertainty regarding the banking industry will ease over the next several years. The economy will exit the recession and enter a period of recovery followed by stability, regulatory uncertainties will settle, consolidation and new ownership patterns will take place, and the re-establishment of stable banking industry operating conditions will lead to a period of renewed growth in the new banking business, whatever shape it takes. Despite political hopes, INPUT does not expect to see a significant and sustained economic turnaround in 1992. This forecast assumes that the pieces for recovery are in place and that the first sign of that recovery will appear in 1992. 1993 will be a year of strong economic activity, driven by industry's reaction to a prolonged period of investment and growth restrictions, and 1994 through 1997 will see a return to more stable and consistent growth patterns. Vendors will see little change in user expenditures in 1992, a spike of growth occurring as the recovery becomes apparent, and then a gradual return to normal revenue growth. Everything is affected by the economic climate. When it improves, the recession is clearly over, and a period of recovery and growth can start. There will then be a gradual return to the traditional growth patterns for information services offerings.

B

Delivery Mode Analysis

As shown in Exhibit IV-2, there are significant differences projected in the five-year growth rates for the information services delivery modes to the banking and finance industry.

EXHIBIT IV-2



1. Processing Services

The banking and finance industry's use of processing services has been strong relative to that of other industry sectors. Use has always been heaviest by smaller and midsized commercial banks, S&Ls, and credit unions not willing to invest in on-site hardware to provide competitive system capabilities.

One change to these conditions during this period will be that some commercial banks and S&Ls (although generally not the smallest) will merge into larger and stronger local and super-regional banks, which generally can be expected to bring processing services in-house for consolidated economies of scale. This move in-house will be particularly true for the S&L segment, which will continue to shrink significantly in numbers through insolvency-caused closures and consolidations.

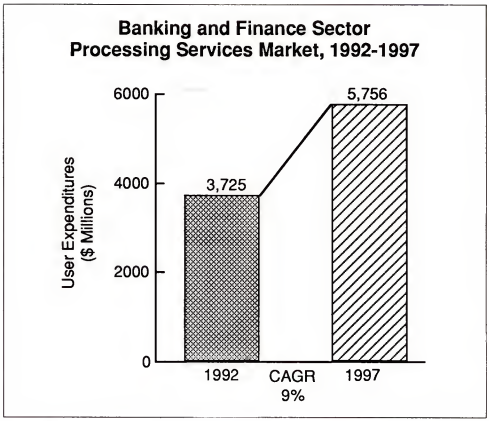
The more important trend, however, will be the increased use of processing services by commercial banks and S&Ls of all sizes, which will shift to processing services to redeploy their capital away from in-house systems and toward meeting higher capital ratio requirements. However, there will be a countertrend whereby some midsized and small commercial banks and S&Ls will find turnkey, minicomputer-based systems to be an increasingly cost-effective alternative to outside processing services' usage-based charges. Because this countertrend will be especially valuable when the bank or S&L is growing, however—and not when capital is short—it will be the lesser trend in the near term. As the economy returns to a period of sustained growth, it will become a significant factor.

There will be a constant increase in the use of credit cards during this period, and a corresponding increase in transaction volumes for third-party card-processing services, which will continue to enjoy highly competitive economies of scale.

Brokerages and nonbank financial services firms typically have not been heavy users of processing services, and no change is expected in this pattern.

Exhibit IV-3 shows the 9% CAGR expected in processing services, based on these trends.

EXHIBIT IV-3



2. Network Services

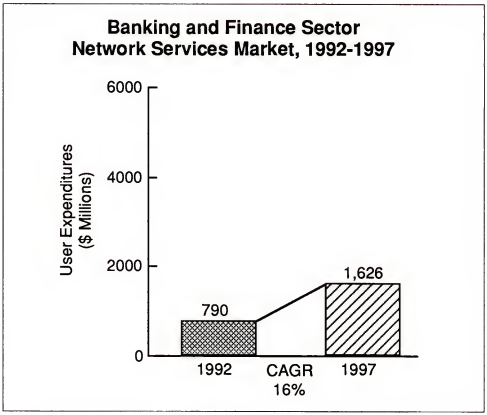
Banking and finance industry firms generally are significant users of network services, especially for value-added data communication services and to a lesser extent for electronically accessed information services. The main use of network services is by bank and nonbank credit card issuers. Issuers handle purchase authorization, generally through value-added access to credit data bases through packet network services such as BT Tymnet and U.S. Sprint's Telenet.

Banking institutions and nonbank financial institutions are all heavy users of network-based credit reporting services, especially from giants such as TRW and Equifax.

Brokerages make quite different use of on-line information sources, ranging from their use of market quotation or information services like Quotron and Reuters for regular or occasional access to multiple specialized information feeds to meet specific trading needs.

Exhibit IV-4 shows the growth expected in network services, based primarily on continuing growth in the use of credit cards. Additional growth from use by brokerages assumes a continuation or increase in current market volumes.

EXHIBIT IV-4



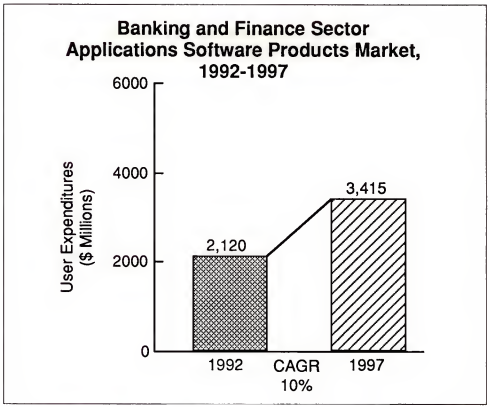
3. Applications Software Products

The banking and finance industry has always made substantial use of packaged software products, especially among the high proportion of small and midsized institutions. Generally, only the largest firms have developed the bulk of their own software systems. Many standard packages are offered, although these often require modification to meet a particular bank's needs. Modification can occur in two ways, with no particular pattern except size of institution. Smaller firms generally contract to the vendor or a third-party consultant (sometimes a small local contractor), whereas larger firms use their in-house information systems staff.

To date, PC-based banking software products (except for spreadsheet-type utilities) have not been particularly relevant in this market sector. There are few PC-based software systems robust enough to meet the high-volume transaction needs of most central banking functions. In parallel, few of the key volume-based banking peripherals are available for PC attachment. Mainframes and minicomputers remain the rule, although this rule could change with PC advances in power. (A related trend at the minicomputer level is covered under Section 6, Turnkey Systems.)

Exhibit IV-5 shows the expected growth in software products. In the short term, bankers increasingly will try to make do with existing systems except where competitive pressures—such as for RDBMS-based support of relationship banking—require new software investments. This growth rate is expected to rise somewhat, based on the return of stability, growth, and profits to the banking industry in general. Later in the period, advances in PC power—and the PC-based high-transaction-rate peripherals required—will tend to power a new generation of PC-based software applications.

EXHIBIT IV-5

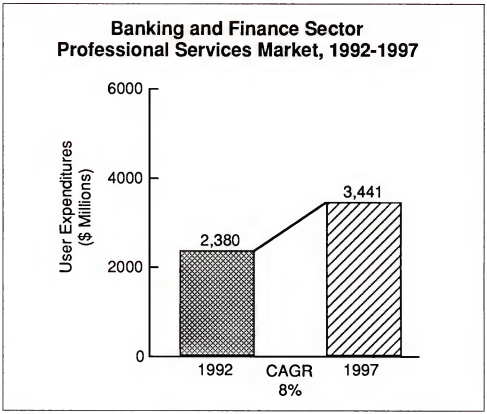


4. Professional Services

The use of professional services by the banking and finance industry is strongest, historically, in the area of contract programmers and other consultants who can satisfy specific programming and systems needs on a relatively short-term, ad-hoc basis. There has also been secondary use of consultants for services such as overall systems evaluation, overviews of technologies and new technical options, and recommendations on directions for re-engineering large systems (where such large systems are typical—in the largest banks, and especially in nonbank financial institutions and large brokerages).

Exhibit IV-6 shows the growth expected in professional services.

EXHIBIT IV-6



The trend in the use of professional services reflects the short-term emphasis on cost control. In this atmosphere, the first cuts generally are made in expendable contract programming and consulting services, as opposed to in-house staff. One exception, ironically, will be cost-control consulting. Such studies, of course, should be required to promise savings in excess of contract costs.

Further, despite the continuing pace of change in information technologies, cash-strapped banks generally will not pay for noncritical technology consulting in the short term. The larger nonbank financial services firms—of which there are relatively few—will likely prove the exception to this trend.

A countertrend may occur toward the end of the forecast period. As the pace of commercial bank consolidation picks up, wide-ranging opportunities should open up for professional services firms to consult with the acquiring firms on systems expansion and/or consolidation.

5. Systems Integration

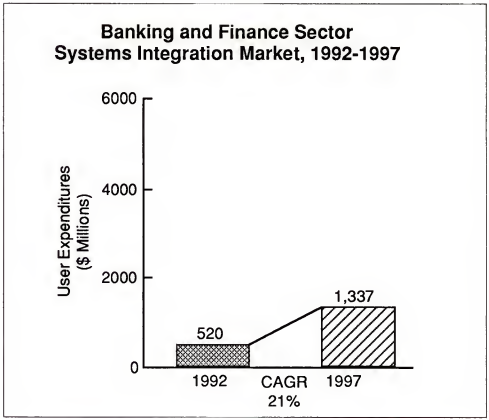
The market for systems integration is closely related to that of professional services. The key distinction between professional services consulting and systems integration is who bears the ultimate responsibility for planning and managing a systems installation project. Consulting firms typically provide analytical or technical support as professional services to their

clients, while seldom bearing responsibility for the result of an implementation project. Systems integrators, in contrast, act as the general contractor on a systems project, assume project management responsibility, and generally bear some financial risk for the success of the project.

To the extent that banks and financial services firms are undertaking large new-systems projects, the complexity of today's information systems and services technologies and the rapid pace of technical change make it increasingly difficult to manage such projects, especially projects requiring a combination of in-house and outside resources.

Exhibit IV-7 shows the growth expected in systems integration. These numbers reflect the fact that, in the short term (1-2 years), relatively few commercial banks, S&Ls, or even brokerages, under current financial conditions, are undertaking complex new projects requiring systems integration services. Over the longer term (2-5 years), demand for the service will grow, as the pace of bank mergers, consolidations and re-engineering of the IS environment accelerates. The services of systems integration firms will be increasingly important to guide newly merged commercial banks through the complexities of systems consolidation. In part, the larger size of the merged organization—especially when there have been multiple, successive takeovers by one institution—eventually should drive many to cost justify larger in-house systems (with or without new technologies such as imaging) that system integrators can help set up.

EXHIBIT IV-7



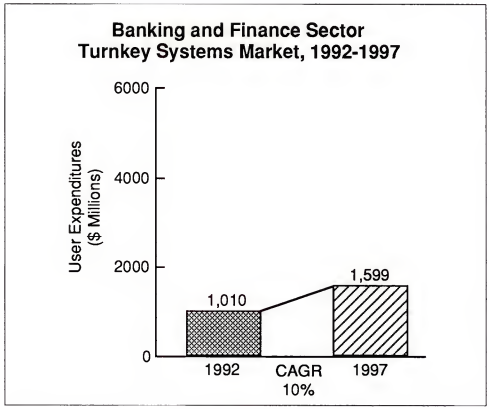
Strong and aggressive nonbank financial services firms can be expected to make relatively greater systems investments, and thus increasingly will tend to transfer such risks and responsibilities to systems integration firms. As aggressive nonbanks are relatively few, though, this transfer makes relatively little difference industrywide.

6. Turnkey Systems

By bundling the required hardware and software into a single package, turnkey systems provide an easy-to-implement solution for many midsized and community commercial banks and S&Ls. This solution is at the price, of course, of generally providing less flexibility for users, thus placing them more at the mercy of the turnkey vendor. Turnkey systems, however, generally provide the user with more flexibility than some processing service vendors' "one-service-fits-all" approach.

Exhibit IV-8 shows the growth expected in turnkey systems, which is driven primarily by a new generation of minicomputer-based systems for banks and S&Ls. These systems increasingly offer cost-effective alternatives to outside processing services, especially for growing institutions wishing to avoid the use-sensitive transaction costs inherent in a processing service. Perhaps more important, the newly cost-effective turnkey systems significantly increase the level of control available to user organizations.

EXHIBIT IV-8

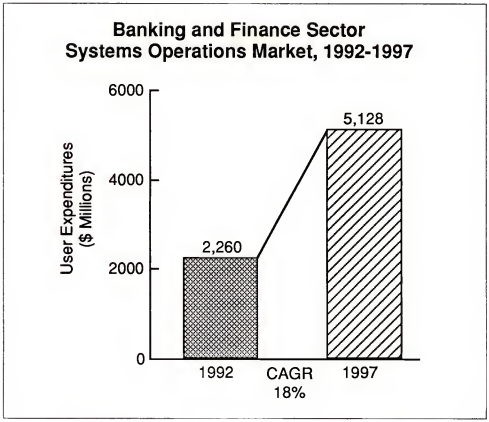


7. Systems Operations

As discussed earlier, systems operations vendors (along with vendors of processing services) were the big winners in the banking industry's recent efforts to cope with low profitability and regulatory requirements for higher capital ratios. A systems operator often offers to purchase a capital-consuming in-house data processing operation and to guarantee the bank or S&L yearly savings over the course of a multiyear contract. Over the forecast period, this combination will continue to outweigh the institution's natural hesitation to give up corporate control over a key business resource. Note, however, that credit unions (which have few in-house systems) and nonbank financial services firms (which have few regulatory requirements and generally higher profitability levels) are largely exempt from such dynamics.

Exhibit IV-9 shows the growth expected in systems operations, based on these trends.

EXHIBIT IV-9



C
Industry Segment Analysis

In Chapter III, the banking and finance sector was segmented into commercial banks, savings institutions, credit unions and brokerages, and other financial services firms. Exhibit IV-10 provides INPUT's forecast for the segments of the banking and finance sector, and offers an estimate of relative market size.

EXHIBIT IV-10

Banking and Finance Sector
Industry Segment Markets, 1992-1997

Industry Segment	1992		1997		1992-1997 CAGR
	$ Millions	Total (Percent)	$ Millions	Total (Percent)	
Commercial Banks	6,530	51	12,260	56	13
Savings Institutions	2,430	19	3,720	17	9
Credit Unions	1,920	15	2,850	13	8
Brokerages & Other Fin. Svcs. Firms	1,920	15	3,070	14	10
Total	12,800	100	21,900	100	11

Several disparate factors are driving the growth rates in information services spending by each of the market segments in the banking and finance sector. The relatively high growth and increasing proportion of the overall information services expenditures by the commercial banking sector is tied to the sector's ability to leverage systems operations and systems integration offerings. These faster growing delivery modes are primarily driven by the medium and larger banking institutions.

Brokerages and other financial services firms show relatively steady but not high growth rates. Brokerages, although emerging from the relative stagnation that persisted for years after the 1987 crash, are still operating cautiously in a market that had risen significantly by 1991, but has not yet shown a clear return to bull market conditions. Business growth may or may not accelerate soon, but crash and layoff memories and continuing budget restrictions will limit increases in information services spending.

The savings institutions and credit unions will see lower growth and a declining proportion of expenditures in the information services sector. These smaller institutions will be able to leverage the lower costs of client/server technology or stick with processing services offerings, and are not inclined to make frequent changes in applications software.

- For credit unions, INPUT assumes that no restrictive legislation to limit their low-cost popularity will be passed as part of federal banking regulatory reform. Enactment of such restrictions would, of course, shift these organizations to an even lower growth path.

- For savings and loans, successes are balancing the failures, but overall growth in information services expenditures will be modest.

Competitive Environment

This section discusses the competitive environment for information services within the banking and finance industry. Leading vendors are identified and representative vendors are profiled.

A

Vendor Characteristics and Competitive Trends

A wide variety and large number of information services vendors serve the banking and finance industry, without any pattern of dominance or concentration of market control. Leading vendors are often banking-industry specialists, such as Systematics, yet many multi-industry vendors—such as the Electronic Data Systems subsidiary of General Motors (EDS)—also rank high. No single profile of vendor characteristics dominates.

Competition is intense for the business of an industry sector that includes many smaller and midsized institutions that make extensive use of information services.

B

Leading Vendors

Exhibit V-1 lists leading information services vendors serving the banking and finance industry.

EXHIBIT V-1

Banking and Finance Sector
Leading Information Services Vendors

	Est'd Market Share (Percent)	Proc. Svcs.	Network Svcs.	Prof. Svcs.	Sys. Int.	Sys. Ops.	Turnkey Sys.	Appls. SW
Andersen	2			x	x			
CDC	1	x	x				x	
Dow Jones	4		x					
EDS	5	x	x	x	x	x		
First Data Res.	2	x						
First Fin. Mgmt.	5	x						
Fiserv	2	x			x			
GEIS	2	x	x	x				
IBM	3	x	x	x	x			x
Quotron	2		x					
Reuters	3		x					
SIAC	2	x		x				
Systematics	2					x		x
TRW	2		x	x	x			

C
Vendor Profiles

A representative group of information services vendors serving the banking and finance industry is listed in Exhibit V-2. These vendors are profiled below.

EXHIBIT V-2

Vendor Profiles

- American Management Systems
- Broadway & Seymour
- First Data Resources
- Hogan Systems
- Mellon Information Systems
- NewTrend
- Price Waterhouse
- SunGard Data Systems
- Systematics

1. American Management Systems (AMS)

The $50 million that AMS derives from the banking and finance industry represents about 20% of AMS's overall revenue. Its business in this sector is concentrated mainly among the largest commercial banks and the big nonbank financial services firms. About 15% of this revenue is from the sale of software products such as those for credit processing and scoring, and for international credit and collections, including support of SWIFT and other electronic messaging systems. The other 85% is professional services revenue derived from support of the software packages, modification of the packages, or custom software development.

The new technology of imaging is integrated by AMS into the credit origination subsystem of the credit processing software package, in the form of images of supporting documents. In expert systems AMS now offers credit-scoring and -advice functions in the loan origination package and has a collections expert system coming. AMS integrates computer-based training technology in two of its software products and builds such courses on a custom basis for clients. Some cooperative processing capabilities linking PC-based system components with the mainframe are part of AMS's platform automation product. For now, AMS is postponing any commitment to OS/2, preferring an open-architecture approach.

Competitively, AMS believes it stands alone against the big CPAs and leading banking and finance industry vendors, because only AMS offers software products and a wide range of consulting services. AMS emphasizes its expertise in system development and the management of systems resources for meeting tough schedules and handling complex tasks. This expertise includes key technology tools such as life cycle productivity methodology and a system design workbench. AMS emphasizes to clients that big-dollar systems investments in the past and the future can achieve correspondingly large paybacks in all bank-processing areas, but only with full integration of systems to make them flexibly accessible to a much broader range of the institution's staff and managers.

AMS sees one of its roles as helping the banking and finance industry apply technology to existing business needs, and finding new applications of technology that were not possible before because the capability did not exist.

2. Broadway & Seymour

Three-quarters of Broadway & Seymour's U.S. revenue of approximately $40 million comes from the banking industry: $15 million from large banks and $15 million from small community banks. The large-bank business is primarily custom system development and maintenance. For small banks, Broadway & Seymour provides turnkey hardware and software systems based on IBM's AS/400 minicomputer system.

In new technologies, Broadway & Seymour supports imaging in two fashions. First, Broadway & Seymour provides low-cost PC-based image statement systems that can be cost-justified at the relatively low check volume levels typical at community banks. Second, Broadway & Seymour's turnkey systems offer the option to print little-used but high-page-count documents—such as the daily balance spool file to write-once, read-many (WORM) optical disk technology—for screen-based access (and printing as required) by the relatively few bank personnel who require such access.

In the community bank market segment, Broadway & Seymour emphasizes its strength, underscored by market position and the market sector's largest number of AS/400-based installations.

3. First Data Resources

First Data Resources—a wholly owned subsidiary of American Express Information Services Company headquartered in Omaha, Nebraska—serves over 700 clients in its processing services-based business of maintaining the data bases and handling all processing of the credit cards issued by clients in the banking and finance industry. First Data Resources' business also includes securitizing credit card receivables for sale to third parties.

First Data Resources sees its competition as other card-processing services and in-house operations. The in-house orientation of some firms and/or their reluctance to break out the costs of credit card processing tends to inhibit the growth of the business, but processing service growth is simultaneously driven by the difficulty of keeping up with changes. The Visa and MasterCard organizations, for example, keep implementing changes that processors must keep up with, and there are also periodic government regulatory changes. In keeping with industry needs and trends, First Data Resources is evaluating how to integrate imaging technology with its service offerings in the near future.

The firm competes with a number of other service vendors, such as Total Systems, Credit Services, and EDS. First Data Resources emphasizes that it has been in the business a long time and has established a depth of resources—technology and people—that is hard to match. First Data Resources has great economies of scale, yet also emphasizes that it can be very flexible in services. Overall, the company likes to say to clients, "If it's been done in credit card processing, First Data Resources has done it."

4. Hogan Systems

Hogan Systems, in Dallas, Texas, employs approximately 400 people and has revenues of $40 to $45 million. Hogan's business is concentrated in software products for large commercial banks, plus some professional services in support of the software. For years it has offered software systems for loans, deposits, and customer information, and now it also provides products for measuring and reporting financial results and for risk analysis. IBM is the exclusive U.S. marketer of the Hogan Integrated Banking Applications software product.

Technologically, Hogan supports moving mainframe functions to distributed platforms, offers an earnings analysis system based on DB2, and is building a presence in the CASE market using a customer relationship system that Hogan has developed with CASE tools that customers can update more easily than prior product offerings.

Competitively, Hogan emphasizes that it offers the most flexible products in its class. They provide better control for the banker, ease of product modification, and rapid implementation of systems to support new bank products. This flexibility and ease of use, Hogan contends, provides significant advantage, although the system is complex. Hogan also profits from installation-oriented consulting services. Newer products position Hogan strongly in the banking sector's transition from emphasizing back-office operational automation to future implementation of new systems offering new management benefits, such as profitability measures and risk analysis.

5. Mellon Information Services

Although it has roots in the internal processing of its Mellon Bank parent, Mellon Information Services has also offered processing services for 25 years to other institutions. Revenues now total more than $250 million. Clients are mostly below the top tier of the sector and include banks and nonbank financial services firms.

Rather than implementing new technologies, the firm emphasizes the breadth of the functionality offered, based on its in-house big-bank experience.

It competes on the banking side with EDS, IBM, Marshall & Iseley, Systematics, and FIserv, and on the nonbank side with EDS, IBM, Genex, and Litton. Mellon's traditional competitive strategy has been to emphasize its years of experience and well-established products and services. Mellon has also added a new service; it will facilitate a customer's conversion from in-house operations by first running the customer's own in-house application on the processing service's computers, and only after a transition period moving to the Mellon system. This transition smooths the conversion process and permits immediate dollar savings.

For nonbanks, Mellon emphasizes support of the latest banking system internal functionality and its speed in handling functions now done manually by clients.

6. NewTrend

In May, 1991, NewTrend was formed with the merger of The NewTrend Group and the INFOPOINT™ Banking Software Division of Computer Associates International, Inc. This new venture is owned equally by Computer Associates and NewTrend, and continues to be privately held.

In 1991, NewTrend derived an estimated $68 million in revenues from the sale of processing services, software products, turnkey systems, systems integration services, and systems operations services to U.S. credit unions, S&Ls, and commercial banks. NewTrend's Unisys-based MISER2 systems include loan origination and processing, central information file, and general ledger applications, while the merged INFOPOINT applications support an IBM-based family of integrated banking software sold primarily to commercial banks.

NewTrend is considering support for the new technologies of imaging and laptop computer communication with the mainframe. The imaging system may be offered on a processing service basis. The laptop communication system would be in support of field personnel who handle loan processing.

Competitively, NewTrend emphasizes processing services (where it competes mainly with Systematics and EDS) and turnkey systems (versus NCR and John Henry). NewTrend points out that, since the merger, almost 1,000 banks, S&Ls, credit unions and other financial institutions use NewTrend products—whether in-house, on a systems operations basis, or through NewTrend's processing service. In fact, the company notes that a bank using NewTrend software in-house can convert to NewTrend's service bureau in a single weekend if required by business changes such as a merger or a regulatory situation. NewTrend offers a strong track record of well-planned implementations that are installed in the number of days promised. NewTrend has positioned itself as a low-cost, high-function vendor that sells on a complete-package basis, without separate add-on contracts and costs. The processing service offering was added two years ago and includes NewTrend's commitment not to place more than 10 banks on a single shared system.

7. Price Waterhouse

Price Waterhouse derives more than $20 million in banking and finance industry information services revenue from the professional services activities of custom software development and system effectiveness reviews provided to all parts of the industry. It also offers software products for securities trading.

Price Waterhouse promotes implementation of imaging technology via the selection of hardware and its implementation. Implementation can be either for high-volume systems for check processing or low-volume systems that support loan documentation. For banks that want to improve electronic funds transfer (EFT) functionality, Price Waterhouse assists with automating EFT message routing, and with setting new EFT strategies. Price Waterhouse also provides professional services support for: banking applications; package implementation; crisis management for systems; custom systems development and implementation; auditing computer systems/operations; and LANs.

Price Waterhouse's primary competitors in the professional services consulting field are First Manhattan, Arthur Andersen, Peat Marwick, Booz Allen, and McKinsey. Two or three years ago, Price Waterhouse shifted competitive emphasis away from health care and government and toward banking and finance. Price Waterhouse emphasizes an interdisciplinary approach that integrates complex solutions to meet organizational, technology, and information-flow needs. Price Waterhouse's strong reputation as a firm is reinforced by excellent references from clients.

8. SunGard Data Systems

SunGard is a major provider of disaster recovery services to all parts of the banking and finance industry. Its primary efforts involve the processing and professional services functions of establishing hot-site backup, consulting on disaster recovery, and business resumption planning. SunGard also offers software products for business recovery functions. At the end of 1990, SunGard had 1,600 employees and total corporate revenues of more than $260 million.

In addition to traditional computing/data center resources, SunGard also provides new technologies such as limited functionality for LAN-based environments. Support may be offered in the future for imaging and EDI functions.

In the disaster recovery market, the firm competes primarily with Comdisco and IBM. SunGard emphasizes its roots in mainframe systems (now evolved to encompass minicomputers as well) and a crisis management approach that tries to accommodate all clients without requiring them to declare a disaster and thus receive services only on a first-come, first-served basis.

In addition to its disaster recovery services, SunGard also offers a broad range of investment support systems. Applications include portfolio management and accounting (INVEST ONE, WISMER SERIES 2), securities trading and accounting (BOLT I and II, TRAC, PHASE3, OMNI GS), trust accounting (OMNITRUST, AUTOTRUST/AT, MICROTRUST), shareholder accounting (INVESTAR, SINSTAR), and other investment accounting (EMBERS, OMNIPLAN, PLAN ONE, PERF-4).

9. Systematics

Systematics serves the entire banking and finance industry, primarily with systems operations services, software products and development/maintenance services. Also offered are other professional services such as training, education, and consulting and a fast-growing business in systems integration (including conversions). Turnkey systems and disaster recovery services are relatively small business areas.

Although not strictly a new technology, Systematics holds a leadership position in the use of PC graphic user interface capabilities to make it easy for all bank personnel to find needed data, with or without RDBMS technology. Systematics also supports imaging for archival storage and image statements.

The firm is an aggressive competitor in systems operations, systems integration, and professional services, and views EDS as a major rival. Hogan is a key software products competitor, and processing services competitors are EDS and FFMC. Systematics emphasizes as its strengths its multidecade record of experience, commitment to the banking and finance marketplace, and full range of products and services. Systematics believes that it provides the only complete banking solution, with offerings for retail, branch, international, trade financing, and monetary exchange. Support of international banking applications is especially important in the emerging global financial community. Systematics' fundamental technology strategy is to maximize efficiency and payback for the client. To this end, Systematics will build or buy the necessary functions to support market demand, and does not feel limited to only in-house development efforts.

Conclusions and Recommendations

A
Industry and Information Services Market Conclusions

The banking and finance industry faces a business and social environment of uncertainty and likely change during the 1990s. This will be especially true during the 1992 election year, as the Bush administration seeks to legislate a broad range of economic and financial reforms in the hope of stimulating the economy into a sustainable recovery. Regulations governing the operations and ownership of all banking segments can be expected to change, although the exact nature of short-range and mid-term changes will be subject to the uncertain interplay of powerful election-year political forces. Many S&Ls have already closed or merged with stronger institutions, and the shrinkage of the S&L segment is far from over. Further consolidation of a commercial bank segment with significant overcapacity appears inevitable. Credit unions can expect to enjoy a relatively unchanged—if unglamorous—future of local-based, nonprofit operation. The bright star, barring unforeseen regulatory changes, will continue to be the competitively aggressive and successful nonbank financial services firms.

The trend toward outsourcing will continue, with the exception that some smaller institutions will find cost-savings opportunities in the use of turnkey platforms. Overcapacity will tend to reduce expenditures for processing services, but needs for systems integration, systems operations, and network services will cause these delivery modes to grow at higher rates than the overall market. Continued budget restraints will slightly reduce expenditures for generic professional consulting services, but many of the savings may be redirected towards systems integration and systems operations activities, as financial institutions position themselves for the expanded global markets of the 1990s.

The uncertainty overshadowing this and any other market forecast is the recession—when it will end, how rapid will be the recovery, and what specific forms the recovery will take. Like Merrill-Lynch, INPUT is "bullish" on America. INPUT believes that all the pieces necessary for a

recovery are in place, and that positive signs will appear in mid-to-late 1992, with a full recovery blossoming in 1993, and it is upon this scenario that INPUT bases its forecast for this market. Should unforeseen political, economic or international factors cause a delay, there will be a proportionate lag in the pick-up of information services spending.

As a result of these economic and industry realities, the market outlook for information services firms selling into the banking and finance sector is one of relatively modest growth in the short term. Institutions will continue spending for information services at a modest growth rate over the relatively conservative level of the past year, and will continue this pattern until a clearly recognizable and sustainable recovery occurs and the regulatory environment stabilizes. For the most part institutions are unlikely, in this environment, to undertake significant new investments.

B

User Issues and Recommendations

1. Technological Issues

Key technological issues faced by banking and finance industry information services users are outlined below.

Mergers and Acquisitions - For an increasing number of bank information systems managers, the key technological issue today is (or tomorrow will be) how best to integrate multiple systems resulting from mergers or acquisitions. At minimum, postmerger integration involves cross-system communication issues, but usually it calls for the elimination of duplicate applications, subsystems, or entire systems/services complexes in favor of integrated and more cost-effective operational environments.

Efficiencies and Downsizing - Even though profits rose in 1991, the key industrywide dynamic of low profit margins and high capital ratio requirements means that systems budgets will continue to be squeezed. Deadlines and user demands, of course, will not decrease in proportion. Thus, instead of evaluating which major investments to make, most systems managers at S&Ls and commercial banks today are faced with constant pressure to get more-efficient performance out of existing systems. This performance can sometimes be coupled with investments in high-performing new technology in the context of systems consolidation—say, from multiple data centers to a single less-costly center. In other cases, it will be both an objective and the result of a rigorous re-engineering of the bank production function, either to gain functional or performance-oriented competitive advantage.

Disaster Recovery - Given the regulatory mandate to plan for disaster recovery, implementing such systems is a priority for any bank that has not already faced the issue. All institutions should recognize that such resources are most effective (and generate the most peace of mind) if they are fully tested, and to this end should be certain that they take advantage of the periodic testing schedules offered by virtually all vendors of contingency processing resources.

Use of Processing Services - Any institution that is considering a switch from in-house support of users to an outside processing service must carefully plan for and manage the change. Some vendors offer a transition plan whereby the user's applications are run for a time through the processing service to identify anomalies in access routines. Cutover to the processing service's own applications and resources are postponed until all production activity is functioning smoothly.

Regulation - Regulatory changes—especially for the S&Ls—are already occurring on a regular basis. Many have significant systems impacts, despite the fact that regulatory agencies rarely factor this consideration into their timeframe requirements. Systems managers must be prepared to handle such disruptions, even in the face of tight or reduced budgets.

RDBMSs - Transition to RDBMS environments is increasingly common, if not yet universal, for commercial banks and S&Ls. Nonbank financial services firms have generally already made the transition. The key technological issue is partly a business issue—understanding the business objectives well enough to choose an RDBMS that will prove cost effective. One of the challenges is projecting the likely system-load and capacity impacts—and therefore the required hardware upgrades, if any, necessary to maintain satisfactory response and performance levels.

Executive Information Systems - One of the main drivers of an institution's transition to an RDBMS will be senior management's desire or demand for an executive information system. Back-office operations (and, more recently, platform transactions and automated tellers) have been fully computerized by most institutions, yet few such systems have generated the high-level management information that can be critical in a fast-changing competitive environment. The new RDBMSs will perform a central role in making possible such executive-level systems. Note that although the costs of information technologies have always been highly visible to banking management, executive-level systems represent a new level of visibility where success will be very important to the systems managers. Successful implementation of executive management systems, and careful attention to executive needs, can smooth the way for many future IS activities.

Imaging - Imaging technologies are being studied at one level or another by most midsized or larger institutions, but are being implemented by relatively few because of high startup costs. An important part of the costs and complexities of implementing imaging is determining how it will impact and integrate with other systems. In general, the free-form nature of electronic images is in marked contrast to the highly formatted numeric content of most of today's banking information systems.

Workstations - Outside of brokerages, the future role of the fast-evolving workstation technology in the banking and finance sector remains uncertain. Raw costs and price/performance ratios are moving fast in the directions that users favor, yet the investment required to use this technology is still sizable. Managers must decide which applications—old or new—will justify such investments, and what systems integration issues must be faced.

CASE - Many commercial banks, S&Ls, and credit unions prefer outside processing services or packaged software to in-house software development. Many institutions with significant software development shops, however, are now evaluating whether to initiate CASE. One stumbling block in today's business environment is the general agreement that, in addition to sizable dollar investments for the required systems environment, initial CASE learning curves generally result in short-term drops in programming productivity. On cost and productivity counts, therefore, CASE investment likely will be postponed by many banking industry firms.

Keeping Pace With Technology - The fact that the banking and finance industry has generally restricted funds for investment in systems has not (obviously) slackened the pace of technological change. Progressive systems managers need to find ways to make the key systems investments required to retain valuable staff if other industries offer better opportunities to use the latest technologies. For example, some investments of time and resources will be required to determine which technologies should be implemented on at least a trial basis. Trials can lead to selective new-technology cost justifications that will ease the burden of coping with a technological flood—and will provide rapidly implemented competitive advantages—as more-profitable times resume for the banking and finance sector.

2. Business Issues

Key business issues that information services users face in the banking and finance industry are summarized below.

Priorities and Resource Allocation - Perhaps the toughest business issue for a banking and finance industry systems manager today is coping with backlogged, continuing, and new user needs in an environment of strict cost controls. An especially thorny issue for many is the additional task, on top of normal responsibilities and priorities, of integrating the systems of one or more merged banks. At some level, a triage mentality may be required, with clear communication to business management that certain current or proposed projects or investments simply must be delayed or cut from the plan in order to make reasonable progress on other higher priority or less costly ones.

Cost Efficiencies - Pressures will continue to be strong to increase the savings from existing systems. Although some institutions are successfully downsizing multiple data centers, far more are considering the cash and/or capital savings implications of switching to a processing service or third-party systems operator. On the other hand, users of processing services are also looking with interest at today's improved price/performance ratios for minicomputer-based turnkey systems.

As usual in times of budgetary restraint in any industry, users of professional services must evaluate whether such spending is actually discretionary, or of relatively lower value than preserving in-house staff or funding alternate investments. An exception is consulting related to cost-cutting or efficiency improvements or alternatives. Similarly, software development departments with reduced or frozen staff levels are evaluating the latest software packages to determine their cost and capabilities versus in-house development.

Recommendations for users that derive from the issues outlined in this section are presented in Exhibit VI-1.

EXHIBIT VI-1

Banking and Finance Sector
User Recommendations

- In all planning, consider the institution's competitive positioning as better times return.
- Deal with uncertainty by planning multiple scenarios, especially those keyed to financial condition and regulatory changes.
- Anticipate a continuation of budgetary restraints and evaluate trade-off opportunities within the systems budget.
- Review and strengthen justifications for high-priority systems budget items.
- If operating in-house, consider a processing service and/or outside systems operations to determine if cost-efficiency savings are feasible.
- Evaluate the cost effectiveness of available software packages versus in-house development.
- Fully understand and balance all business needs before choosing an RDBMS. Don't choose a dead-end alternative; know what your long-term needs will be and choose an RDBMS that can accommodate them.
- Carefully evaluate costs and benefits before undertaking imaging. Try a low-cost pilot and consider delaying implementation until costs drop or competitive pressures increase.
- Require demonstrated value for each professional services dollar.
- If your institution is of medium size or smaller, consider the benefits of the latest generation of minicomputer-based turnkey systems.
- If your institution has distributed resources, consider downsizing or merging multiple data centers.
- Determine the institution's likely merger opportunities, if any, and realistically assess the resulting systems impacts.
- Retain valuable staff. One way to do this is to make at least some investment in new technologies.

C

Information Services Vendor Issues and Recommendations

Recommendations for information services vendors generally parallel those for users, as they derive from the same set of issues. These recommendations are presented in Exhibit VI-2.

EXHIBIT VI-2

Banking and Finance Sector Vendor Recommendations

- Provide new and stronger cost justifications that buyers can present to their management.
- Develop sales approaches that recognize that cash and capital are especially tight now for most institutions in the banking and finance sector.
- Proactively defend budget line items with user management.
- Processing services vendors or outside systems operators should use this opportunity to press the case for preserving cash and/or capital.
- Vendors of software packages should ask those who have declined such resources in the past to reconsider, given the cost effectiveness of outside rather than internal development under current economic conditions.
- Minicomputer-based turnkey systems vendors must actively sell any new advantages in cost effectiveness.
- Professional services firms must be prepared to offer well-documented and tougher cost justifications of the value they deliver and the services they provide.
- Professional services firms or systems operators should look for opportunities to help larger institutions downsize or merge multiple data centers or other redundant resources.
- RDBMS vendors should work with the client to understand all current and future business needs and thus present the strongest case for their product.
- Imaging vendors should consider offering low-cost "get-acquainted" pilots.
- New technology vendors must emphasize the importance of a continuing investment in order to retain valuable staff members.
- Consider each existing user's likely merger opportunities and the impacts, positive and negative, on the vendor's systems or services.
- Look at interim business planning and consider creating scenarios to account for changes in regulations and user financial condition.
- Identify and promote the benefits of investing now to achieve competitive advantages as banking industry conditions improve.
- Place more emphasis on selling to financially and competitively strong nonbank financial services firms.

Definitions

No industry-specific definition have been used in this report.

See the separate volume, INPUT's *Definition of Terms*, for the general definitions of industry structure and delivery modes used throughout INPUT reports.

Forecast Data Base

A
Forecast Data Base

Exhibit B-1 presents the detailed 1991-1997 forecasts for the banking and finance sector.

EXHIBIT B-1

Banking and Finance Sector
User Expenditure Forecast by Delivery Mode,
1991-1997

Delivery Modes	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Sector Total	12,050	6	12,805	14,726	16,468	18,140	19,955	21,950	11
Processing Services	3,495	7	3,725	4,284	4,659	4,999	5,364	5,756	9
- Transaction Processing	3,495	7	3,725	4,284	4,659	4,999	5,364	5,756	9
Turnkey Systems	965	5	1,010	1,162	1,272	1,370	1,485	1,599	10
Applications Software Products	2,040	4	2,120	2,438	2,662	2,807	3,102	3,415	10
- Mainframe	898	4	933	1,073	1,170	1,175	1,294	1,424	9
- Minicomputer	653	4	678	780	853	934	1,027	1,126	11
- Workstation/PC	490	4	509	585	638	699	780	866	11
Systems Operations	2,055	10	2,260	2,599	3,167	3,726	4,381	5,128	18
Systems Integration	480	8	520	598	717	852	1,045	1,337	21
Professional Services	2,290	4	2,380	2,737	2,922	3,091	3,262	3,441	8
Network Services	725	9	790	909	1,070	1,227	1,417	1,626	16
- Electronic Info. Svcs.	638	9	695	799	644	1,088	1,250	1,431	16
- Network Applications	87	9	95	109	125	139	167	195	16

B

Forecast Reconciliation

Exhibit B-2 represents the forecast reconciliation for the banking and finance sector.

EXHIBIT B-2

Banking and Finance
1992 MAP Data Base Reconciliation

Delivery Modes	1991 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Actual) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total	12,194	12,050	-144	-1	20,199	19,955	-244	-1	11	11
Processing Services	3,440	3,495	55	2	4,988	5,364	376	1	8	9
Turnkey Systems	1,000	965	-35	-4	1,460	1,485	25	2	8	9
Applications Software	2,270	2,040	-230	-10	3,480	3,102	-378	-11	9	9
Systems Operations	2,046	2,055	9	<1	4,659	4,381	-278	-6	18	16
Systems Integration	404	480	76	19	1,022	1,045	23	2	20	17
Professional Services	2,184	2,290	106	5	2,880	3,262	382	13	6	7
Network Services	850	725	-125	-15	1,710	1,417	-293	-17	15	14

The significant differences between the 1991 and 1992 forecasts are as follows:

Overall growth of the information services market within the banking and finance industry was slightly less than expected. This results in a reduction in the market size of $144 million at the end of 1991, as compared to the prior year's projection. User expenditures were just over $12 billion, as compared to the forecast $12.2 billion. These changes reflect the continuing effects of the recession, which many had hoped would end in 1991.

Applications software and network services expenditures were projected to grow in 1991 but as a result of the continued effects of the economic slowdown, actually declined from 1990. Reflecting an ongoing concern with cost efficiency and the need to integrate resources resulting from mergers and aquisitions, actual spending levels for systems integration grew in 1991.

Expenditures for turnkey systems and professional services were greater than forecast by $35 million and $106 million, respectively. Both represent positive variances of 4%-5% from last year's forecast. The professional services variance reflects the continued dependence by the financial services market on critical consulting and training skills offered by professional services vendors. Use of turnkey systems declined despite increased insourcing by small and midsized banks using cost-effective turnkey platforms.

The 1991-1996 CAGR percentages have remained fairly constant, with some variance in the systems integration rate resulting from delays in the economic recovery. By 1997, however, continued aggressive growth in SI expenditure will move the 1992-1997 CAGR to 21%. Essentially, the 1990 and 1991 numbers represent industry reactions to economic uncertainty, and the 1992 through 1997 forecasts are based upon INPUT's assumptions as to when, and at what pace, a sustainable recovery will occur.

About INPUT

INPUT provides planning information, analysis, and recommendations for the information technology industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

Subscription services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services. INPUT specializes in the software and services industry which includes software products, systems operations, processing services, network services, systems integration, professional services, turnkey systems, and customer services. Particular areas of expertise include CASE analysis, information systems planning, and outsourcing.

Many of INPUT's professional staff members have more than 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed as a privately held corporation in 1974, INPUT has become a leading international research and consulting firm. Clients include more than 100 of the world's largest and most technically advanced companies.

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